The College of

SCIENCE & MATH

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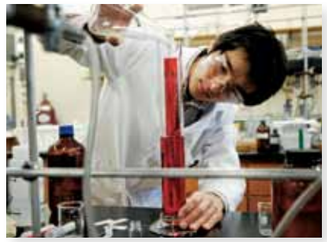
A century of innovation and discovery

NDSU NORTH DAKOTA STATE UNIVERSITY



NDSU's College of Science and Mathematics: *a century of discovery*

Edwin Ladd and Ladd Hall photos courtesy of NDSU Archives.

Cover photo: Katie Reindl, assistant professor of biological sciences, (left) and Sheel Patel, BS '11, zoology, work in Reindl's lab. Her research focuses on chemoprevention and cancer treatment through the use of dietary agents that alter the expression and activity of cancer-related genes.

With a century of success as its foundation, North Dakota State University's College of Science and Mathematics is resolute in its efforts to be an ever-growing force for quality education, research and service. That resounding message came to the fore as the college recently celebrated the 100-year anniversary of NDSU's Ladd Hall and the legacy of renowned researcher Edwin F. Ladd.

During the Ladd Legacy Symposium on May 16, two noted NDSU alumni lauded Ladd's groundbreaking research. Philip Anfinrud, BS '81, is an intramural faculty member at the National Institute of Diabetes and Digestive and Kidney Diseases at the National Institutes of Health. Organic chemist Marvin Miller, BS '71, is the George and Winifred Clark Professor at the University of Notre Dame Department of Chemistry and Biochemistry. Both said Ladd's efforts were the groundwork for today's leading-edge research at NDSU.

Hired as the university's second faculty member in 1890, Ladd was a chemist who became a premier consumer advocate. Almost single-handedly, he took on grain dealers, meat packers, grocery distributors and packagers of patent medicines. Primarily through his influence, the Federal Pure Food and Drug Act was adopted in 1906.

Ladd's impact grew from his battles, and later his collaboration, with the paint industry. Concerned that paint meet state specifications for linseed oil, white lead and pigments, Ladd produced 1905's "Paints and Paint Products," which contained the first analysis of leading brands of ready-mixed paints. His ongoing research became legendary, and eventually he gained the appreciation and support of the industry and the public. Ladd, who was elected to the U.S. Senate in 1920, is credited with building the framework for NDSU's acclaimed Department of Coatings and Polymeric Materials.

Through the decades, contributions by other faculty moved the college in ever expanding research areas.

NDSU's first president, Horace E. Stockbridge, was a chemist and geologist who wrote the popular textbook, "Rocks and Soils: Their Origin, Composition and Characteristics; Chemical, Geological and Agricultural." Orin A. Stevens came to NDSU in 1901, and became renowned for his systematic research of North Dakota's ecology.

Biology faculty member H.E. Metcalf made news in 1918 by housing 500 rats in the Chemistry Building to conduct tests on the food value of heated and cold milk. Ralph Dunbar joined the chemistry department in 1937, wrote several textbooks and became editor of a chemistry encyclopedia. In 1938, Warren Whitman joined the botany faculty and became a leading authority. Zoologists Frank Cassel and Gabe Comita came to campus in 1950 and gained fame with their wildlife research.

The NDSU computer age dawned in 1961 when an IBM 1620 was installed.

Then, the laboratories of Dunbar Hall were constructed in 1964, the same year James Sugihara came to NDSU as dean of what was then the College of Chemistry and Physics. "I was a part of changes and improvements that occurred. Important appointments and new faculty gave the institution a new impetus," said Sugihara, noting the college reorganized with departments from the former College of Arts and Science in 1973 to create today's College of Science and Mathematics.

Important, noteworthy work by NDSU researchers continued.

John Brophy, chair of geology, reported in 1974 an amazing fossil find in North Dakota – a mosasaur that lived 80 million years ago.

During the 1980s, John Peterka, professor emeritus of zoology, conducted important studies related to the Garrison Diversion project. Gregory Gillispie, professor of chemistry, invented a technique for remote sensing of petroleum contamination of soils and groundwater. Chemist Philip Boudjouk's work in synthesizing new silicon compounds was named by the American Chemical Society as one of the 20 most significant discoveries of 1984.

"It was wonderful to be a part of a steady improvement for the college," Sugihara said. "That, of course, has since been accelerated."

Those ongoing research efforts, and many more, set the stage for the college's current activity, which is embodied in the college's mission statement: "Through teaching, research, service and outreach, we provide knowledge, skills and insight to a world increasingly dependent on science and mathematics" and its vision to be a "dynamic environment offering premier opportunities to explore, discover and achieve."

Those words mesh perfectly with the thoughts of NDSU President Dean L. Bresciani. During his first State of the University Address on Sept. 29, 2010, Bresciani said a rare "window of opportunity" exists in North Dakota, and he challenged the campus community to imagine the opportunity to help shape the state during the coming century.

"We may never have the opportunity we do now to reposition perceptions of North Dakota and NDSU," Bresciani said. "We may never have the opportunity we do now to catapult the economic vitality, diversity and competitiveness of our state past others in the nation, and to enhance its attractiveness to not only the young North Dakotans who are our future, but also to the best and brightest minds of people throughout the country."

It's a challenge the college is ready to meet, according to Kevin McCaul, dean of science and mathematics. "We absolutely

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have a national presence and a strong international presence as well," he said. "In some ways, many people in our college are known nationally and internationally rather than they are regionally."

There is much evidence to support that statement. Worldwide collaborations are commonplace across the college. Here are just a few:

The Department of Computer Science has entered into agreements with two colleges in China, much through the efforts of professor Kendall Nygard. With Zhejiang Economic and Trade Polytechnic (ZJETP) in Hangzhou, undergraduate students from that institution will transfer to NDSU after two years, and then complete an NDSU bachelor's degree. Faculty members from ZJETP also will come to NDSU for workshops. An agreement has been signed with Three Gorges University in Hubei Province.

In physics, associate professor Thomas Ihle works on theory and computer simulation of self-driven systems with colleagues in Germany. Silvio May has ongoing collaborations with faculty at the University of Ljubljana in Slovenia and Friedrich-Schiller University in Germany. Alan Denton conducts research on charged colloids with a university in Germany and works on colloid-polymer mixtures with an institution in Sweden. Daniel Kroll has a longstanding collaboration with the director of the soft matter and biophysics group at Forschingszentrum Juelich in Germany.

In the Department of Chemistry and Biochemistry, Sivaguru Jayaraman's research group collaborates with Osaka University in Japan to uncover the effect of elevated pressures during intrinsic racemization of atropchiral chromophores. His group also partners with the Universidade do Algarve in Portugal to explore supramolecular interactions using ion-trap mass spectrometry.

In geosciences, University Distinguished Professor Allan Ashworth works closely with colleagues in Europe and Australia, while Bernhardt Saini-Eidukat, associate professor and chair, collaborates with a university in Germany.

"There has been a major thrust forward in NDSU becoming a research-based institution." – *James Sugihara*

And what lies ahead? According to people in the college, there are a host of opportunities to meet the evolving needs of the region, nation and world.

At the NDSU Department of Coatings and Polymeric Materials, for example, leading-edge research is seen as vital in the paint industry, which has a $100 billion annual world market. Stuart Croll, professor and chair, sees NDSU as a pre-eminent organic coatings research university now and in the future.

Croll notes the department has more than 50 coatings projects under way in association with the Center for Nanoscale Science and Engineering and Center for Surface Protection. "Dr. Ladd was right in choosing the coatings niche," Croll said. "If we add together the expertise of our five faculty members with colleagues in engineering, physics, pharmaceutical sciences and high performance computing, that's about 20 faculty and a great number of graduate students. We could rival the big polymer science universities."

Harsharan Randhawa, a doctoral student in the cellular and molecular biology program, studies the effects of dietary components on chemoprevention and cancer treatment.

McCaul, meantime, envisions a series of summer "think tanks" for the college to forge new partnerships and new ways of conducting research. "We are on the cutting-edge of a number of different research areas. I think new interdisciplinary areas are really going to carry us into the future," he explained. "In coming years, we'll expand into areas that don't rely on a single researcher working by themselves in a lab, but rather multiple researchers attacking problems."

In addition to research, McCaul also predicts the college will continue as a leader in education and service.

"One could make the argument that during the next century we will be even more on the cutting-edge than we are today because of the abundance of natural resources that we have in North Dakota," he said. "People will need to invest in the future, but I can see us in the College of Science and Mathematics becoming even more important players than we are today."

For people like Sugihara that outlook is a source of pride, based on a century of accomplishment, coupled with strong expectations.

"There has been a major thrust forward in NDSU becoming a research-based institution. Some of us could not have imagined what has occurred to the present time," Sugihara said. "This momentum is going to continue, and we can look to an even brighter future." *Steve Bergeson*

North Dakota State University is an amazing place, a model for others in higher education to emulate. As you read this issue of the College of Science and Mathematics newsletter, you'll see how an important sector of our institution has changed and progressed during the past century. You will read about the college's past accomplishments, present successes and our great hopes for the decades to come.

NDSU is truly a shining example of a successful student focused, land grant, research institution – and the rest of the country is noticing our achievements. NDSU recently was named to the elite "Research University/Very High Research" category by the Carnegie Commission on Higher Education. The Carnegie Very High Research categorization represents the 108 most successful private and public universities in the nation. NDSU is the first and only North Dakota university to attain this status.

The Carnegie recognition is important to our university, and it demonstrates NDSU's commitment to pushing the frontiers of knowledge. But, our work is not done.

NDSU is in the midst of a strategic planning effort to outline our future. The Strategic Planning Committee, with 20 members from across campus and six ex-officio members, was charged with providing criteria to identify NDSU academic and research programs that are at or near national or international status. These programs will then be tabbed for future enhancement funding, when investment funds become available. It is a significant effort that will enable us to react quickly to opportunities.

I continue to be impressed by the sense of community and campus pride that we have at NDSU. It is a place dedicated to the land grant mission of quality education, leading research and outstanding service. NDSU clearly makes a difference in the lives of students and the vitality of our community, state, region and nation. By making a difference, we will define our future, and, I believe, put NDSU in a position to achieve even more.

Dean L. Bresciani

"The more things change, the more they remain the same"
Alphonse Carr, French novelist

You will find stories related to both change and stability in this year's newsletter, and such themes are prevalent on campus these days. In the newsletter, you will learn about new faculty members, new research thrusts in the college, a relatively new doctoral program in science, math and technology (STEM) education, and a new classroom modernization project. But you also will read about the 100th anniversary of Ladd Hall (yes, it is still here and helping to turn out chemistry graduates), successful graduates from the college (not unusual – we have successful graduates going back way more than 100 years!), and donors to the college during the previous year (many of whom provide us every year with flexible funding to support students, staff and faculty).

The university also is changing. This is the first newsletter in 11 years presenting a message from a new president; as of July 1, we will have the first new provost in 15 years; and other administrators retiring this year include Vice President for University Relations Keith Bjerke, Vice President for Information Technology Bonnie Neas and Dean Thomas Riley for the College of Arts, Humanities and Social Sciences. On the other hand, the stability of some of our best professors in the college is nothing short of amazing. For example:

- Gary Clambey helped team teach a new course in "Foundations of Science" – he has been teaching multiple courses in botany and biology since 1974.
- William "Bill" Perrizo continues to teach computer science – he has been doing so since 1973.
- Allan Ashworth continues to teach geosciences, although he claims to be done with Antarctica visits – he has been doing so since 1972.
- Warren Shreve continues to teach mathematics – he has been doing so since 1970.
- And last, but certainly not least, Mel Morris continues to help students succeed in chemistry; he helped the first such student in 1963.

So we change – we continue to do things better than before. And we also stay the same – NDSU is still the home of the Bison. Come visit us and you will be impressed by the new – and the old.

Kevin D. McCaul
www.ndsu.edu/scimath

Peggy Biga, assistant professor of biological sciences, and zoology doctoral student Jacob Froehlich examine a mouse displaying double-muscling phenotype and resistance to high-fat diet obesity.

Researcher studies link between muscle tissue and metabolic diseases

Obesity and type 2 diabetes are two of the nation's most prevalent and concerning health issues. While they have been linked to lifestyle factors such as diet and exercise, the mechanisms controlling the pathophysiology behind the conditions are unclear.

To better understand what makes some people more prone to obesity and type 2 diabetes, Peggy Biga, assistant professor of biological sciences, and her lab researchers are analyzing interactions between muscle growth regulating genes and metabolic diseases.

"The typical paradigm about obesity and diabetes is that it's a localized effect involving pancreas and adipose tissue. Scientists rarely look at muscle tissue even though muscle is the metabolic workhorse of an organism," Biga said.

Biga's laboratory, which conducts research on muscle growth and regeneration, has been studying the correlation between muscle tissue and susceptibility to obesity for roughly five years.

"As we see in the human population there's a lot of variation with friends who can eat whatever they want and don't gain weight," Biga said. "That's what we're trying to model – what you see in the normal population and take it back to metabolic growth and metabolic regulating genes."

Biga's research uses two strains of inbred mice – one highly susceptible to high-fat diet induced obesity and the other completely resistant. For 12 weeks, mice from each group were fed a high-fat diet and others were fed a regular diet. At the end, an average mouse in the susceptible group weighed 44 grams, compared to a resistant mouse weighing 20 grams. The obese mice began to show signs of type 2 diabetes at four to five weeks and full-blown diabetes around 12 weeks.

"It's really interesting. You basically have the same kind of organism showing completely different responses to the exact same treatment. If we can figure out how they are doing that, then it might be easier to help people," Biga said. "That's the overall gist of what we're trying to do."

The key difference between the resistant group and control group is the presence or absence of a growth factor called myostatin, which negatively regulates muscle growth. Without it, a condition known as double muscling occurs.

Double muscling was first noticed about 60 years in certain breeds of cattle and in Whippets, a breed of dog. But its cause (the lack of myostatin) wasn't identified until 1997.

Double muscling also can occur in humans. In 2000, a boy was born in Germany without myostatin. By age five, he could extend his arms holding seven-pound weights. He had muscles twice the size of his peers and half their body weight.

According to Biga, animals that lack myostatin are resistant to high-fat diet induced obesity. This made Biga think about the role myostatin, and muscle growth, might have in regulating local metabolic changes related to type 2 diabetes caused by obesity.

> "If we can figure out how they are doing that then it might be easier to help people." – *Peggy Biga*

"Generally there's a trend where the metabolic dysfunction occurs in the muscle tissue first before you see full-blown type 2 diabetes," Biga said. "We were really interested in trying to investigate if myostatin has a role in that."

Biga's lab also noticed a greater inflammatory response among the obese mice, suggesting subjects with high levels of myostatin may be more susceptible to infection. "There's some recent evidence that shows obese people tend to have higher incidence or prevalence of getting the flu," Biga said.

Those results led to another study. Some of the mice on the high-fat diet were given a bacterial infection and researchers tracked what cells are upregulated, or increased, in response to the infection. Biga says if they can determine what specific cells are upregulated then the cells potentially could be targeted by a therapeutic for myostatin. "The way it looks, at least with obesity, is if you have high levels of myostatin, there is probably poor growth potential or regeneration or repair potential, then you are more likely susceptible to some sort of metabolic shift and potentially infection," she said.

One element that differentiates Biga's research is the comprehensive approach: looking at how various systems work together. "We're looking at a bunch of different physiological processes, not just one. We're really interested in what the communication is between growth, metabolism and immunity," she said.

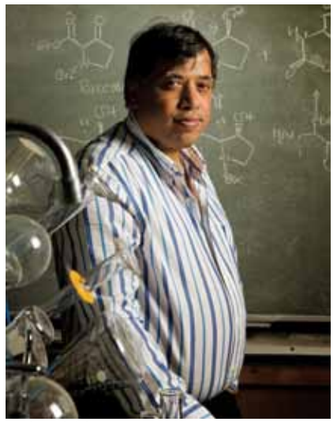
Biga's lab also has used fish to model the same type of physiological response. "It's hard to make fish obese," she said. "But we see the same trend among what we would consider the obesity-resistant group. We're trying to use basic science to understand what is going on with the communication between muscle cells and fat cells that alters a organism's overall fitness."

The next step for Biga is studying viral infections, because humans demonstrate higher prevalence of viral infections, particularly the flu, when they have weight problems or type 2 diabetes.

According to Biga, the research will continue as long as funding is available. "We will always go in directions that the research tells us is the most interesting," she said. "The research won't end; it just may take a different route."

Linsey Davis

NDSU's two largest grants impact students and research



Mukund Sibi

The National Institutes of Health began the Center for Biomedical Research Excellence (COBRE) grant program in 2000 to help states that typically don't receive much grant funding for medical research. Two North Dakota State University programs have benefited from COBRE grants, and both are in their renewal period.

The more established of the two COBRE grants at NDSU is directed by Mukund Sibi, University Distinguished Professor and James A. Meier Professor. He and his team earned a COBRE grant renewal in 2007 for $10.5 million. With the funding, they created a lab where chemistry, biology and pharmaceutical sciences collaborate to investigate a class of enzymes called matrix metalloproteinases, a key biological player in several diseases including cancer and asthma.

"It is a notoriously hard enzyme to tackle," Sibi said. "There has been a lot of research over the years. It was and still is a difficult beast to tame."

With the funding, new faculty members were recruited by several colleges at NDSU and a core biology facility usable by faculty across several disciplines was built. While the first five years focused largely on chemistry advancements, the second five years saw a shift toward biology research. Sibi credits the existence of the biology facility as a reason the university has been able to recruit a number of talented new faculty. Students also have benefited through summer research programs.

Sibi said the grant has helped to provide startup funding for up to 15 faculty members and hire 40 to 50 undergraduate, graduate and postdoctoral students a year.

"They are all doing science," he said. "It's spectacular. That's the success you want, to be able to do state-of-the-art research. We've been able to successfully initiate a new area of science."

Now one year away from the end of the grant cycle, plans are to apply soon for a $5 million bridging grant to maintain the current research while seeking new sources of funding.

Mark McCourt, the James A. Meier and Dale Hogoboom Professor of Psychology, earned the first COBRE grant for $8.9 million in 2004. He received a renewal grant for $10.7 million in 2010 along with about $2 million in administrative supplements in 2009 and 2010 from the National Institutes of Health National Center for Research Resources.

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The first five years of grant support allowed the department to increase the breadth of their research to understand the brain mechanisms of perception and cognition. As perceptual and cognitive changes are biomarkers of several diseases like autism and Alzheimer's, a better understanding of how perception and cognition are related to brain function may lead to better diagnostic tests to screen for disorders.

> "It was and still is a difficult beast to tame." – *Mukund Sibi*

The new equipment to help with this research includes a high density EEG (electroencephalography) laboratory, a driving simulator, and state of the art eye-tracking equipment. The investment is beginning to bear fruit through published papers despite a lengthy remodeling project to install the equipment and renovation after the partial collapse of Minard Hall, which kept much of the equipment out of reach for more than a year.

"We persevered and managed to be successful enough to be renewed, which is no mean feat," McCourt said. "The NIH has faith in us that we're accomplishing our mission."

The first grant helped in hiring two new faculty, technical staff and postdoctoral researchers. It also helped the COBRE researchers recruit and support graduate students.

"Without grants of this kind, we would not have a graduate program," McCourt said.

The grant also benefits undergraduate students.

"I would say if there are students out there whose interest is to go on to graduate school in visual or cognitive neuroscience, we can make it happen for them," McCourt said.

Joel Hagen

NDSU is hub for STEM education research

Assistant professor Warren Christensen, right, works with a student in the University Physics class.

A non-traditional research area is gaining momentum among American scientists and mathematicians, and NDSU is a driving force behind it.

It's called Science, Technology, Engineering and Mathematics (STEM) education research, also known as discipline-based education research. Essentially, scientists and mathematicians use their training to apply research methodologies, commonly associated with cognitive sciences and education, to investigate how people teach and learn areas of science and mathematics.

From analyzing students' ability to transfer calculus skills to the physics classroom to more broadly looking at how students develop and articulate hypotheses to examining curriculum and assessment, STEM education research covers a variety of topics, but each has the same goal in mind – to better understand the complex system of how people learn subjects like physics, biology, chemistry, biochemistry and mathematics.

NDSU is one of the first universities in the nation to offer a graduate program in STEM education. It embraced the emerging field in 2007 by adding three tenure-track positions and establishing an interdisciplinary doctoral program between the College of Science and Mathematics and the School of Education.

Students use colored cards to answer mulitiple-choice questions during class, allowing Christensen to quickly gauge students' understanding of material.

Donald Schwert, professor of geosciences and director of the STEM education program, said discipline-based education research is the result of an enhanced national focus on effective teaching and learning of STEM disciplines at the collegiate level.

Physics education was the first to be recognized as a legitimate research area by the American Physical Society in 1999. Other STEM fields gradually followed, and today the National Science Foundation and other government agencies provide grant support for STEM education research.

"Biology people do bench research, wet lab sorts of things, hormone testing, physiological response and work on model organisms. Or they might be ecologists in the field collecting data from wetland data soils species," explained Lisa Montplaisir, assistant professor of biological sciences. "Our lab is the classroom and the students who are in the classroom."

Warren Christensen, assistant professor of physics, says STEM education research follows the same scientific approach and level of intensity as traditional research. "The rigor with which STEM education research is conducted matches that with which a biological scientist or a physicist would use on an experiment," he said. "Any claim that can be made has to be rooted in the evidence. You are not allowed to overstate data that you have."

The role of scientist combined with the knowledge that comes from teaching science courses provide the foundation for the research. "We come at this with an understanding of what the concepts are. That includes questions we ask. Our scientific training influences how we answer those questions, the data we collect and the evidence we will accept as support of the claims we then make," said Jennifer Momsen, assistant professor of biology.

Partnering with the School of Education adds a valuable interdisciplinary aspect. "We have this additional training that allows us to bridge 'science speak' with education learning sciences to make sense of what's happening in the classroom," Montplaisir said.

Students enrolled in the STEM education doctoral program are prepared to be college faculty whose research focuses on teaching and learning at the college level and can teach at the undergraduate and graduate levels in their selected STEM discipline.

Students in the program complete course work that centers on graduate-level courses in the discipline area, a common core of STEM education courses and elective courses focused on research training. Although interdisciplinary in nature, graduate students in the STEM education doctoral program have an academic home in the STEM department or program of their discipline preference.

For both students and faculty, an attractive feature of NDSU's STEM education program is the network of faculty.

Mila Kryjevskaia, assistant professor of physics, says the opportunity to collaborate with colleagues from other departments in an interdisciplinary group is rare. "Quite often only one faculty does this type of research in the entire department or maybe in the entire college," she said. "We have a unique situation that we have many faculty in the College of Science and Mathematics who do discipline-based research in education."

That collaboration attracted Momsen to NDSU. "When I came to campus and was interviewed, I got to see that there was this broader community of scientists. There was a broad recognition of this important worthwhile endeavor," she said. "NDSU recognizes that you are a research thread and to be a research thread you can't be one person holding it. You have to have multiple people."

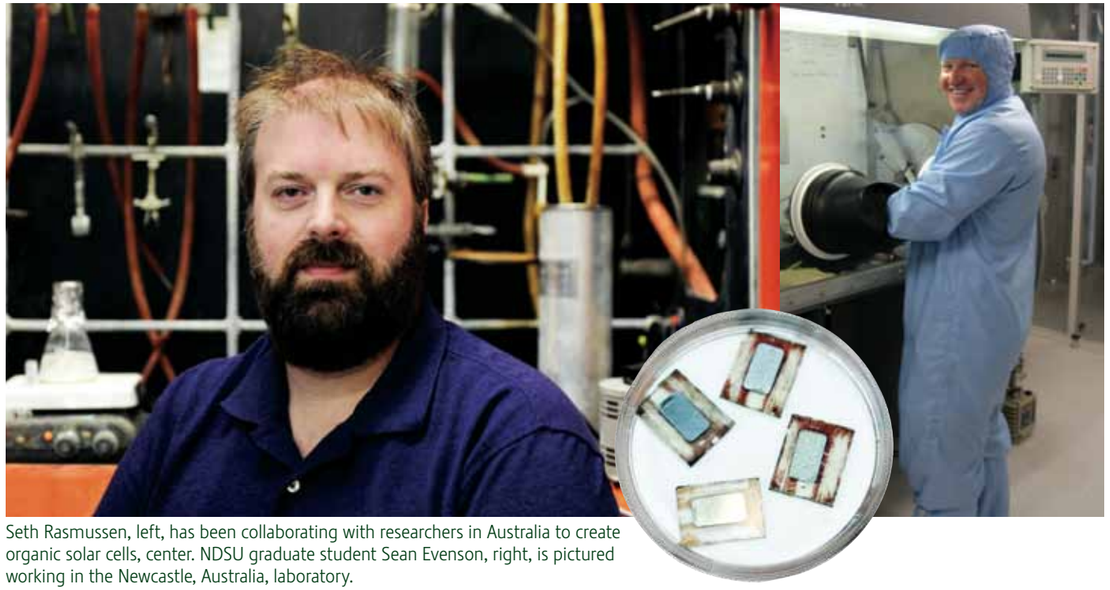
Schwert said what makes it successful at NDSU is the ability to hire talented faculty. "They add an excitement and a new research focus into their own disciplines and across the college and the campus," he said, noting the overall goal in time is to have discipline-specific education researchers in every department in the college.

> "Our lab is the classroom and the students who are in the classroom." – *Lisa Montplaisir*

Other universities recognize the uniqueness of NDSU's program. At a recent biology education research conference, some NDSU faculty were repeatedly asked, "What's going on at NDSU that is putting you on the map in terms of the place to be?"

"It comes down to a lot of vision at the college level. This was a broad umbrella saying, 'Yes, this is important,' " Momsen said. "Why not have North Dakota be at the forefront of it if we can?"

Linsey Davis



Seth Rasmussen, left, has been collaborating with researchers in Australia to create organic solar cells, center. NDSU graduate student Sean Evenson, right, is pictured working in the Newcastle, Australia, laboratory.

Overseas collaboration energizes research

Organic based solar cells have the potential to revolutionize renewable energy technology. Cheaper and more flexible than their silicon-based counterparts, organic solar cells can be incorporated into places not ordinarily used for gathering the sun's energy. They can be sewn into clothing so soldiers can cut down on battery weight. Messenger bags can have them in the cover flap to power cellphones and computers. They can even be used in windows to power office buildings.

A seven-year collaboration in cutting-edge solar cell technology research began at a conference in 2004 where Seth Rasmussen, associate professor of chemistry at NDSU, met Paul Dastoor, professor of physics and director of the Centre for Organic Electronics at the University of Newcastle, Australia. Rasmussen introduced himself and expressed interest in Dastoor's efforts in building electronic devices.

"We both agreed that it would be great if he could come up to Newcastle and we could both start trying to incorporate his polymers into our devices," Dastoor said.

They have been developing solar cells and light detectors from new semi-conducting organic materials ever since. Rasmussen and Dastoor specialize in a subset of the cells that can absorb near infrared light. In addition to development of solar cells that absorb more of the solar spectrum, such detection with cheaper materials could help in the development of better fiber-optic communication networks.

"The science behind these types of devices can't really be done by a single person," Rasmussen said. "We're both working on two halves of the problem."

Rasmussen has been working with the materials used in these solar cells since 1999, but didn't have the expertise to build the solar cell itself. Dastoor would have to rely on commercially available materials without a synthetic chemist. Their collaboration is based on friendship, respect and a "passionate excitement for the science," Dastoor said.

"The reason I continue to work in the area is there are always interesting and new materials that I can envision and then sit down and construct," Rasmussen said.

Their research in North Dakota currently is funded through the National Science Foundation, which also supports travel to Australia. Rasmussen has even taken students along to help with the research.

> "We're both working on two halves of the problem." – *Seth Rasmussen*

Sean Evenson, a chemistry graduate student from Benson, Minn., traveled with Rasmussen to Australia from Feb. 4 to March 4, 2010. He had an opportunity to study the physics involved in creating solar cells. "My job at NDSU is mainly synthesis, and I would normally just pass the materials on to someone else to make the devices," he said. "It was really refreshing to see the end result and to have actually been a part of that process."

Rasmussen plans to take another student this summer.

"The main thing that's in it for me is being able to develop new materials and being able to contribute to the field," Rasmussen said. "I'm less concerned with making the next commercial device as really being able to advance the science behind these types of devices." *Joel Hagen*

NDSU project gives mathematicians a historical perspective

Dogan Comez

Jim Coykendall

It's a mathematician's glimpse of the past, and, perhaps, a connection with greatness.

The Mathematics Genealogy Project, a service managed by the NDSU Department of Mathematics in association with the American Mathematical Society, resembles a "family tree." Mathematicians can discover who advised their adviser, who their adviser's adviser's adviser was, and so on back through history.

"When mathematicians start something, they cannot stop," explained Dogan Comez, professor and chair of mathematics. "We like to trace our lineage back to a big name in mathematics."

Comez proudly says his personal history includes David Hilbert, a German mathematician often considered the most influential mathematician of the 19th and early 20th centuries.

The project's database currently contains more than 150,000 records and is continually growing. The website dedicated to the project (http://genealogy.math.ndsu.nodak.edu) receives hundreds of hits each day, and a recent mention by Wired.com magazine has triggered more interest (www.wired.com/magazine/tag/mathematics).

> "My genealogy goes back to the 1300s. Once it gets so far back, it's not purely mathematics. I might have an alchemist or two in my history." – *Jim Coykendall*

"Mathematically, one idea follows another and we like to see where a theory started," Comez said, noting the same reasoning follows when considering the educational lineage of advisers.

"Mathematicians are inherently interested in discovering this genealogy about themselves," he said. "Your PhD adviser's influence is enormous. You usually get your main research from them, and the adviser is the primary guide to solve problems and connect us to others in the field. We revere the individual, just as our adviser did of his or her adviser."

> "Mathematicians are inherently interested in discovering this genealogy about themselves." – *Dogan Comez*

The Mathematics Genealogy Project was the brainchild of Harry Coonce, a former faculty member at Minnesota State University, Mankato, who took a sabbatical at NDSU in the late 1990s and is still an adjunct faculty member here. When he retired in 1999, Coonce spent much of his time gathering data and information, with the aim to form a genealogy tree for all mathematicians. NDSU has housed the project since 2003.

It's been incredibly popular among mathematicians. Two NDSU graduate students print out requested posters of tree genealogy diagrams, usually producing 10 or more per week.

"My genealogy goes back to the 1300s," said Jim Coykendall, James A. Meier Professor of mathematics. "Once it gets so far back, it's not purely mathematics. I might have an alchemist or two in my history."

Coykendall said the department has produced genealogy diagrams for each of its faculty members. The results have been interesting.

"I'd say the most celebrated mathematician since the 1400s is Carl Gauss (a German mathematician and scientist born in 1777). My lineage comes through him, as does the history of 70 to 75 percent of all mathematicians. So, Dogan and I are related," Coykendall said.

The latest recognition by Wired.com is expected to push the interest to greater heights. Engineers and people in other fields who use mathematics are expected to join in.

"This publicity really is good for us and should help us build the database," Comez said. "It's a fun project, and because there are always new mathematicians coming onto the scene, it will never end." *Steve Bergeson*

Distinguished alumnus leads ConocoPhillips technology

There are big employment opportunities emerging in the oil industry, according to a highly regarded NDSU alumnus. As interim senior vice president for technology at Conoco Phillips Co., Merl R. Lindstrom knows his subject inside and out.

"In the past 18 months, I've hired more than 40 PhDs, and we're looking to hire that many more in the next 18 months," said Lindstrom, who earned his bachelor's and doctoral degrees at NDSU. "I tell students, 'Don't overlook the energy industry.' We're a mature industry, with half of the workforce in technology eligible for retirement. Our workforce is going to turn over in four or five years, so this is great time for young people to get in on the ground floor."

That's the message Lindstrom shared with students April 20 during a campus visit to acknowledge his selection as the distinguished alumnus of the College of Science and Mathematics.

"This honor means a lot to me. I was very fortunate to get my degrees from NDSU, and it's been a great foundation for me to build on over the years. I've been blessed," Lindstrom said.

Based in Bartlesville, Okla., Lindstrom oversees a division with 700 creative researchers and staff, working in such areas as chemistry, biology, materials and engineering. "It is an intellectually stimulating atmosphere," he said. "Our people are always coming up with new things to try. My job is to help get the funds and resources for them, and then get out of the way. I let them do their creative thing."

Lindstrom's career path began in 1978, when he joined Phillips Petroleum after earning his bachelor's degree and doctorate in chemistry at NDSU. He has enjoyed remarkable success, holding such important positions as vice president for Research and Development; general manager of Research and Development Downstream Technologies; manager of the Chemicals Division Research and Development; director of Alloys, Blends and Compounds; and supervisor for the Advanced Materials Section.

> "I was very fortunate to get my degrees from NDSU... I've been blessed."
>
> *– Merl Lindstrom*

One of his personal highlights came in the early 1980s, when he helped develop an advanced carbon fiber composite material for the F-111 stealth fighter.

"I led a team of some of the most eclectic people you would ever want – a nuclear engineer, a nuclear physicist, a polymer chemist, a couple of technicians and myself," Lindstrom said with a laugh. "We had no idea how we were going to do it, yet within a year we had developed a material approved by the Air Force. We worked our tails off, but we enjoyed every minute of it. We had a great time."

Distinguished alumnus Merle Lindstrom meets with students and Dean Kevin McCaul during his campus visit.

Lindstrom, who grew up on a family farm near Sheyenne, N.D., notes North Dakota will soon be the third largest oil-producing state, behind only Texas and Alaska. He said the Midwest work ethic, combined with the collaborative nature of people here, make NDSU graduates attractive to the industry.

"It's really a great business to work in," Lindstrom said. "It's been a blast for me. I had visited eight states and Canada when I joined Phillips Petroleum. I've now been in more than 30 countries and all 50 states. I've had a great time and worked with some amazing people."

As he approaches his 60th birthday, Lindstrom said he sometimes contemplates the future. "I've always thought it would be fun to be a university president. I sit on a few boards of technology-related companies, and I find that type of work stimulating," he said. "Let's put it this way – I'm not ready go sit in a rocking chair quite yet."

Lindstrom lives in Dewey, Okla.

Alumnus receives Achievement Award

John F. Anderson

BS '57, zoology; MS '59, entomology

Anderson has been honored with the Henry L. Bolley Academic Achievement Award. Anderson, who is a distinguished scientist at the Connecticut Agricultural Experiment Station in New Haven, Conn., was recognized during ceremonies May 12 on the NDSU campus.

Anderson has written more than 280 scientific manuscripts in medical, veterinary, forest and general entomology. For the past 25 years, he has focused his research on emerging infectious diseases of humans and veterinary animals associated with mosquitoes and ticks. In 1999, he led the successful effort to isolate the exotic West Nile virus found in mosquitoes and birds in the New World. Anderson also has worked as a lecturer and researcher at the prestigious Yale School of Medicine.

The award is sponsored by the NDSU Alumni Association.

Students receive chemistry scholarships

Chemistry students Luke Dykema and Nate Grosz were awarded the prestigious North Dakota State University Hach Scientific Foundation Chemistry Teacher Scholarships. The $6,000 scholarships recognize undergraduate students majoring in chemistry who are committed to becoming high school chemistry teachers. Dykema is a junior majoring in chemistry education, while Grosz is a senior majoring in chemistry and chemistry education and minoring in mathematics.

Luke Dykema

Nate Grosz

"I was very excited and consider it an honor to receive this scholarship," Dykema said. Dykema, from Raymond, Minn., plans to use his passion for science and math to inspire young people. "I cannot wait to get in the classroom and be able to impact the lives of students. Teaching them chemistry will be important, but my main motivation is to be a positive influence on the students and help them to develop socially and emotionally too."

Grosz, from Mandan, N.D., was surprised by the award. "I was ecstatic to say the least." He will use the scholarship and his excitement for chemistry to pursue a career as a teacher.

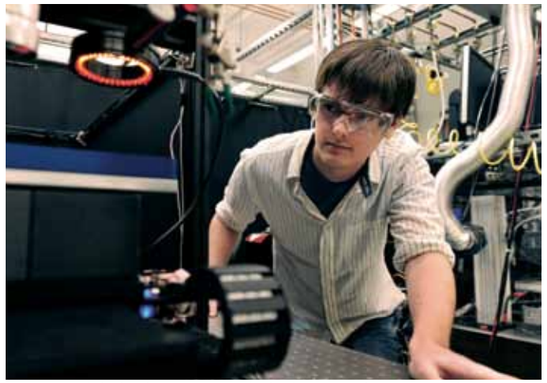
"When I think about teaching, it brings a smile to my face. Every time I've helped a friend or a random stranger with chemistry I've enjoyed it," Grosz said. "To me, chemistry represents the unseen world that still has unknown lands to be explored."

Both students largely attribute the strength of the chemistry program at NDSU to their success. "The chemistry classes at NDSU challenge me and help me to develop a deeper understanding of the foundational concepts of chemistry," Dykema said. Grosz said the approachable faculty and helpful students are what he likes most about the chemistry program.

After graduation, Dykema plans to teach high school chemistry in Minnesota. He also plans to coach football and track. Grosz plans to work as a chemistry teacher in the Fargo-Moorhead area after graduating from NDSU. He would like to attend graduate school and eventually teach at the college level.

Vanessa Hellermann

Undergraduate researcher receives Astronaut Scholarship



Astronaut Scholarship recipient Cody Gette conducts research at NDSU's Center for Nanoscale Science and Engineering.

When senior Cody Gette stumbled upon an interest in physics, he ran with it. "I started my NDSU career in engineering, but switched to physics after taking only one physics course," Gette said. "I find physics to be one of the most challenging and demanding subjects, and that's part of the reason I enjoy it."

His passion for discovery and challenge led Gette, a native of Devils Lake, N.D., to pursue a double major in physics and mathematics. As a sophomore, he took a position with NDSU's Center for Nanoscale Science and Engineering as an undergraduate research assistant and has worked there ever since. He conducts silicon solar cell research and works with high-power lasers. Gette's research experience and dedication to academics has made him stand out in the physics and mathematics departments at NDSU.

Gette was selected to receive the distinguished Astronaut Scholarship Foundation scholarship for the 2010-11 academic year. The $10,000 award is one of 20 presented by the foundation. He uses the scholarship to cover the cost of tuition, books and fees at NDSU.

Gette was ecstatic about the scholarship. "I was honored to be nominated for the scholarship in the first place, knowing there were many equally bright students I work with every day that could have been nominated," he said. Gette was nominated for the scholarship by his professor and academic adviser, Orven Swenson.

Swenson, associate professor of physics, wrote in a letter of nomination, "Based on my observations of hundreds of physics and engineering students, I am confident that Cody has the 'right stuff' to make significant research breakthroughs. His creativity, combined with his demonstrated ability, will ensure his success."

Upon graduating from NDSU, Gette plans to pursue a doctorate in physics, with a career in research or teaching. "I have always been asked to try to explain physics concepts to friends who do not understand and have since developed a small passion for trying to explain concepts in such a way so everyone can understand," Gette wrote in his scholarship application.

The six surviving members of America's original Mercury Seven astronauts established the Astronaut Scholarship Foundation in 1984. Its mission is to aid the United States in retaining leadership in science and technology by providing scholarships for college students who exhibit motivation, imagination and exceptional performance in engineering, science or mathematics.

Vanessa Hellermann

NDSU research on 'front lines' of conservation efforts

Justin Fisher

Northern leopard frogs have been so abundant we take them for granted. But, now, there is growing concern their numbers could be dwindling dramatically.

Research by NDSU graduate student Justin Fisher may prove instrumental as the U.S. Fish and Wildlife Service considers whether the black-spotted frog should be placed on the endangered species list west of the Mississippi River. Fisher, a doctoral student in the environmental and conservation sciences graduate program is trying to find out what is happening to the frog population to help in that decision-making process.

"They are an iconic amphibian species that we have known throughout the North American continent. In North Dakota, they are practically everywhere," explained Fisher, noting the frogs are found in ponds and swamps across our region in both rural and urban settings.

Funded through a grant from the North Dakota Game and Fish Department, Fisher is conducting his valuable research under the supervision of Craig Stockwell, associate professor of biological sciences.

Last summer, Fisher took samples from 50 frog populations across the state, and he'll do the same this summer. "My research is molecular-based genetics work. I extract DNA from the frogs' toes and I look at the genetic variations of each local population," he said. "This is useful in identifying populations that have experienced severe population reductions."

In addition, Fisher is exploring agriculture practices, land-use patterns and precipitation amounts during the past 20 years. He's studying the environmental processes that may be affecting the frog populations.

"Amphibians are considered good bio-indicators. They allow you to investigate the health of the environment, because frogs have semi-permeable skin that can absorb environmental contaminants," said Fisher, who earned his bachelor's degree in zoology at NDSU in 2007. "I am really interested in conservation biology and being pro-active. I like being on the front lines to show how research can mitigate future losses."

Several agencies have expressed interest in Fisher's work, and North Dakota may prove to be a national model. "It's been really interesting because we're one of the only states probing into this," he said. "We're helping both regional and federal managers, and we're using North Dakota as the study site.

A native of Jamestown, N.D., Fisher hopes to teach and conduct research after earning his doctorate from NDSU in 2013.

The northern leopard frog is disappearing. NDSU graduate student Justin Fisher wants to find out why.

Graduate student receives research fellowship

Dereck Stonefish

Dereck Stonefish, a graduate student in the Department of Biological Sciences, was awarded a prestigious National Science Foundation Graduate Research Fellowship.

The fellowship was awarded for a three-year period from 2011 to 2014 and carries a total award of $151,500 for research-related expenses. The NSF noted that Stonefish's selection "was based on your outstanding abilities and accomplishments, as well as your potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise."

Stonefish, who is pursuing a doctorate in zoology, is conducting research on the migratory ecology of red-winged blackbirds and yellow-headed blackbirds that are summer residents in North Dakota. He uses geo-locators to track the movements of these birds from North Dakota to their wintering grounds and then back to North Dakota. Stonefish says he is "happy, humbled and grateful" to be given the opportunities afforded by the fellowship.

"His project not only will provide major insights into the migratory ecology of these species, but the information also will be used to assess how impacts of global climate change may affect migration of these birds," said Erin Gillam, assistant professor of biological sciences, and Stonefish's adviser. Stonefish conducts his field research in the prairie pothole region of North Dakota.

Stonefish previously received a Graduate Student Research Assistantship Native American pilot project award in 2010 from the North Dakota Experimental Program to Stimulate Competitive Research (ND EPSCoR). He is a graduate of Sitting Bull College, Fort Yates, N.D. Stonefish is one of only four tribal college graduates in the U.S. to receive an NSF Graduate Research Fellowship since 2006. Stonefish also previously participated in the Nurturing American Tribal Undergraduate Research and Education (NATURE) program sponsored by ND EPSCoR.

The National Science Foundation Graduate Research Fellowship Program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering and mathematics disciplines who are pursuing research-based master's and doctoral degrees in the U.S. and abroad.

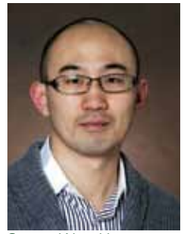

Benjamin Balas


Jason Boynton


Christopher Colbert


Erin Conwell


Andrew Croll

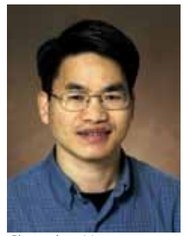

Seung Won Hyun


Svetlana Kilina


Simone Ludwig


Jennifer Momsen


Gang Shen


Changhui Yan

NDSU
NEW FACULTY

Benjamin Balas
Assistant professor of psychology
Doctorate from Massachusetts Institute of Technology
Research interest: neural basis of face and object recognition

Jason Boynton
Assistant professor of mathematics
Doctorate from Florida Atlantic University
Research interest: non-Noetherian commutative algebra and Theory of Factorization

Christopher Colbert
Assistant professor of chemistry and biochemistry
Doctorate from Purdue University
Research interest: structural biology

Erin Conwell
Assistant professor of psychology
Doctorate from Brown University
Research interest: language development in early childhood

Andrew Croll
Assistant professor of physics
Doctorate from McMaster University
Research interest: polymer physics, thin films and confinement and supramolecular assembly

Seung Won Hyun
Assistant professor of statistics
Doctorate from University of Missouri
Research interest: optimal designs, adaptive design and clinical trials

Svetlana Kilina
Assistant professor of chemistry and biochemistry
Doctorate from University of Washington
Research interest: computation chemistry

Simone Ludwig
Associate professor computer science
Doctorate from Brunel University, United Kingdom
Research interest: artificial intelligence and distributed computing

Jennifer Momsen
Assistant professor of biological sciences
Doctorate from Rutgers University
Research interest: teaching and learning of undergraduate biology

Gang Shen
Assistant professor of statistics
Doctorate from Purdue University
Research interest: mathematical statistics, asymptotic theory and Bayesian analysis

Changhui Yan
Assistant professor of computer science
Doctorate from Iowa State University
Research interest: bioinformatics, computational biology, machine learning and data mining


Mukund Sibi

Sibi receives mentoring award

University Distinguished Professor Mukund Sibi was awarded the college's Paul Juell Mentorship Award for 2011. The honor acknowledges exceptional mentoring at the department, college, university or professional level.

Sibi was nominated by Sivaguru Jayaraman, assistant professor of chemistry and biochemistry, with several supporting letters from colleagues and former and current students.

"Muk has not only distinguished himself as an academician but also as a person who has the mettle to nurture and tutor young faculty in our college," Jayaraman wrote, praising Sibi's advice and insightful suggestions. "I would like to emphasize the invaluable and selfless guidance that he has provided and continues to do so to me and to the next generation of academicians."

Sibi, who directs the Center for Protease Research (CPR), joined the NDSU faculty in 1987. He received the prestigious Arthur C. Cope Scholar Award in 2008. Sibi earned his bachelor's and master's degrees at Bangalore University in India and his doctorate from City University of New York. He held postdoctoral positions at Dartmouth College and University of Waterloo.

In a letter of support, Kendra Greenlee, assistant professor of biological sciences, called Sibi an excellent role model for junior faculty. "I have benefited immensely from my involvement with CPR and Dr. Sibi specifically," she wrote.


Sean Sather-Wagstaff

Sather-Wagstaff honored for research

Sean Sather-Wagstaff, assistant professor of mathematics, is the 2011 recipient of the College of Science and Mathematics Award for Excellence in Research. He was recognized for his work in commutative algebra and homological algebra.

"Sean was widely known early on for his prowess in commutative algebra. He is widely considered one of the brightest rising stars in the field," wrote Jim Coykendall, James A. Meier Professor of mathematics, in a letter of nomination. He wrote Sather-Wagstaff has published or submitted 29 papers since joining the NDSU faculty in 2007, and he is one of the most cited authors in the department. "He is a true scientist. It is always about the mathematics with him and his interests are very liberal and encompassing."

Sather-Wagstaff earned his bachelor's degree at the University of California at Berkeley, and his master's degree and doctorate from the University of Utah. In 2010, he was inducted into the NDSU Tapestry of Diverse Talents.


Gary Clambey

Stoetzer and Clambey recognized for service

Linda Stoetzer and Gary Clambey share this year's College of Science and Mathematics Service Award.

Stoetzer, account technician in the Department of Chemistry and Biochemistry, was nominated by Greg Cook, professor and department chair. "She is an outstanding staff member who can be completely and consistently relied upon to complete any task assigned to her, and she has been performing her duties for 40 years," Cook wrote, noting he could not imagine the department functioning without her. "Linda's service to the department, college and university is extraordinary. She will be sorely missed if and when she ever decides to retire."

Clambey, associate professor of biological sciences, has a long history of participation in campus committees and groups. He has chaired and served on several search committees, served 14 years on the Curriculum Committee and was a member of the Promotion, Tenure and Evaluation Committee. Also a member of the department's Self Study Committee for regional accreditation, Clambey has received many honors, including the Odney Award, Blue Key Distinguished Educator, the college's Excellence in Teaching Award and Mortar Board Preferred Professor.

"In his 35 years at NDSU, none of us is aware of a single instance when he was asked to do something for students or his department, college or university that he did not say yes," wrote 15 colleagues in the biological sciences department in a letter of nomination. "Given his long and distinguished record of service, Gary Clambey epitomizes the embodiment of this award."


Sivaguru Jayaraman

Jayaraman honored for teaching

Sivaguru Jayaraman, assistant professor of chemistry and biochemistry, has been selected to receive the 2011 College of Science and Mathematics Teaching Award.

Greg Cook, professor and department chair, described Jayaraman as "a scientist and educator of high promise" in a letter of nomination.

"Dr. Jayaraman is truly an excellent teacher," Cook wrote, noting Jayaraman has taught classes at both the undergraduate and graduate levels. "He teaches sophomore organic chemistry with a lot of flair and enthusiasm and brings his extensive computer expertise to help students in the classroom. At the graduate level, Dr. Jayaraman teaches courses in physical organic chemistry, spectroscopy and is currently teaching a special topics course in photochemistry which is being simultaneously broadcast over the Internet to students at Columbia University and the University of Miami."

continued on page 18

Jayaraman joined the NDSU faculty in 2006, following a postdoctoral research position at Columbia University. He earned his bachelor's degree at Bharathidasan University, St. Joseph's University, Trichy, India; his master's degree at Indian Institute of Technology, Madras, India; and his doctorate from Tulane University, New Orleans.


Anne Denton

Denton named to James A. Meier Junior Professorship

Anne Denton, associate professor of computer science, has been named the James A. Meier Junior Professor. "She possesses a balanced academic record demonstrating excellence in teaching, research and service," wrote Brian Slator, professor and department head, in a letter of nomination. "Within this record is a history of mentorship and student support on research projects."

Slator noted Denton's research interest in developing data mining techniques for diverse problems, her nearly 40 peer-reviewed journal and conference publications and her collaborations with colleagues. He also recognized her work with Governor's School students and outreach efforts with five tribal colleges.

Denton earned her master's degree in computer science at NDSU and her doctorate in physics at the University of Stuttgart. She joined the NDSU faculty as an assistant professor in 2003.

The professorship endowment is funded by James A. Meier, BS '59, mathematics. He earned his chemistry doctorate in 1971 and an honorary doctorate from NDSU in 2007.


Verlin Hinsz

Hinsz receives research recognition

Verlin Hinsz, professor of psychology, was recognized with NDSU's Waldron Research Award. Department of Psychology colleagues Paul Rokke, Mark McCourt and James Council nominated Hinsz. They noted his research focuses on social and informational factors that facilitate and hinder motivation, decision making and performance.

"Dr. Hinsz has boundless energy, and his productivity seems to climb every year," they wrote in a letter of nomination. "The recent years of output have been particularly impressive (seven publications in 2009, eight in 2010 and several currently in press). Dr. Hinsz has produced a model of the sustained, well-funded and productive research program."

Hinsz earned his bachelor's degree at NDSU, and master's degree and doctorate at the University of Illinois, Urbana-Champaign. He joined the NDSU faculty in 1983. His vita includes more than 182 national and international professional presentations.


Greg Cook

Cook honored with Odney Award

Greg Cook, professor and chair of chemistry and biochemistry, received the Odney Award, which recognizes outstanding faculty teaching.

"He is an excellent teacher, cares about his students and is very personable," wrote Felicia Lamb, a senior majoring in nursing, in a letter of nomination. "Dr. Cook is the type of professor that every university envies, and it has been a privilege to have him as my chemistry instructor."

Former student Robert Kargbo, a senior research scientist for AMRI Inc., Albany, N.Y., said Cook is a deserving and qualified recipient. "I have observed and tremendously benefited from the exceptional teaching ability, patience and unusual enthusiasm Prof. Cook has demonstrated," he wrote. "To say that Prof. Cook is a great teacher at NDSU would be an understatement."

Johnathan Schultz, a senior majoring in chemistry, wrote, "Dr. Cook is an asset to the university because he takes an active interest in the education of students, not only in the classroom and the laboratory, but in all of their endeavors."

Cook earned his bachelor's degree at Olivet College and master's degree and doctorate at Michigan State University. He was a National Institutes of Health fellow at Stanford University. Cook joined NDSU in 1996 and has taught more than 3,200 students while on campus.


Dean Knudson

Knudson acknowledged with Peltier Award

Dean Knudson, associate professor of computer science, was selected for NDSU's Peltier Award for Teaching Innovation.

Brian Slator, professor and department head of computer science, nominated Knudson, saying he has transformed the computer science capstone experience into a course integrating theory and industry methods in conjunction with regional businesses.

"Over the years, this course has been refined and expanded, following industry initiatives, and providing students with authentic 'learn-by-doing' experiences using modern tools and methods borrowed from the regional companies that sponsor the projects," Slator wrote. "Students do real projects for real companies, drawing on their NDSU course work and training in order to effectively learn company methods and tools."

Knudson earned his bachelor's degree at Concordia College, master's degree at Bowling Green State University and doctorate at Northwestern University. He joined the NDSU faculty in 2004, after a career with companies such as Microsoft Business Solutions, Fargo; Northrop Grumman Corp., Rolling Meadows, Ill.; and Honeywell Inc., Minneapolis.


Wenfang Sun

Sun receives Presidential Professorship

Wenfang Sun, associate professor of chemistry and biochemistry, received the Walter F. and Verna Gerhts Presidential Professorship.

Greg Cook, professor and chair of the Department of Chemistry and Biochemistry, nominated Sun for the professorship, calling her a prolific researcher, excellent educator, outstanding colleague and leader in service. "To say that Dr. Sun has been a productive researcher is a gross understatement. Since arriving at NDSU, she has amassed a truly impressive publication record," wrote Cook. "Since 2001 she has published more than 40 peer-reviewed journal articles, half of these published since she was tenured in 2007."

Sun earned a bachelor's degree in chemistry from Wuhan University, China; a doctorate in chemistry from the Institute of Photographic Chemistry, Chinese Academy of Sciences, Beijing, and did postdoctoral work at the University of Alabama, Birmingham.

The Gerhts professorship is for faculty at the associate professor rank with at least five years of service. The award comes with a $5,000 stipend to be used for academic purposes.

Share your news

Send an e-mail to keri.drinka@ndsu.edu.

Include your name, year you graduated, degree(s) earned, daytime phone number, current address, employer and position. Include promotions, honors, awards, major projects, volunteer activities, important family news or any news you'd like to share.

Biological Sciences

Department completes review process

A campuswide committee reviews each NDSU program and department every seven years. This year biological sciences completed the process. The faculty in the department spent about six months drafting a self-study document addressing space and equipment, enrollment trends, employment of graduates and teaching and research accomplishments.

Since 2003 undergraduate majors increased from 332 to 500; graduate students increased from 30 to 52; students who took department courses increased by 45 percent; annual research funding increased from $854,000 to $1.525 million; several thousand square feet of teaching and research space was remodeled; and four online courses, including Concepts in Biology, Human Biology, and Human Anatomy and Physiology I and II, were developed and taught.

Chemistry and Biochemistry

Research funding soars, two join faculty

The department has been on a steep upward trajectory of excellence in research and education. Since 2000, nearly two-thirds of current faculty are new hires, creating a department that is young, enthusiastic and talented. Two new faculty members joined the department in 2010: Christopher Colbert in structural biology, and Svetlana Kilina in theoretical materials chemistry.

The department has built on its strengths in materials science and biomedical research, and is a leader on campus in advancing STEM education research. Annual research expenditures, one measure of research activity, have risen from about $1.5 million annually to more than $4.5 million per year. This year, the department achieved a record number of federally funded grants to support cutting-edge science by researchers. This attracted one of the largest classes of first-year graduate students ever in fall 2010. A new website has been implemented with a new, easy-to-navigate design. Visit www.ndsu.edu/chemistry for more detailed news and information.

Computer Science

Perrizo receives patent

University Distinguished Professor Bill Perrizo received his fifth United States patent, which the NDSU Research Foundation licensed to Treeminer Inc. The vertical data mining method offers significant accuracy and scalability advantages over current methods. Perrizo and his team developed the technology tool to help government and businesses quickly process massive data sets.

Brian Slator, department head, received a $1.08 million Small Business Innovation Research grant from the National Institutes of Health for a commercialization project by WoWiWe Instruction Co. LLC. Simone Ludwig joined the faculty as an associate professor, and Oksana Myronovych was promoted to professor of practice. Dean Knudson, associate professor, set up a university-industry consortium between the computer science department and regional businesses to provide research to benefit affiliates.

IACC 244 Linux lab was remodeled and is now a laboratory/classroom. Departmental and research servers are being moved to a new computer virtualization system, and server room networking is being upgraded to 10 gigabit per second.

Coatings and Polymeric Materials

Webster to be recognized

Professor Dean Webster will be the recipient of the American Chemical Society's Roy W. Tess Award, which recognizes outstanding individual achievements and noteworthy contributions to coatings science, technology and engineering. Webster will receive the award at the national meeting in Denver later this year, when there will be a symposium in his honor. NDSU will sponsor an evening reception that all alumni will be welcome to attend, regardless of their attendance at the symposium.

Geosciences

Faculty continues leading research

University Distinguished Professor Allan Ashworth completed another successful Antarctic expedition with Adam Lewis, associate professor, and students.

Ken Lepper, associate professor, continues to focus on whether large lakes are drivers of, or responses to, global climate change events.

Peter Oduor, assistant professor, is mentoring six graduate students on diverse projects including wastewater remediation and the impact of forest conversion on water quality.

Adam Lewis, assistant professor, and co-principal investigator Ken Lepper received new National Science Foundation funding with alumna Jane Willenbring, of the University of Pennsylvania, to investigate past millennial-scale climate change in Antarctica.

Led by Bernhardt Saini-Eidukat, department chair, an NSF proposal was funded for laboratory renovation in Geosciences Hall. Phil Boudjouk, vice president for research, creative activities and technology transfer, is the grant's principal investigator. Saini-Eidukat acquired an EDXRF for chemical analysis, and continues investigating erionite.

Senior lecturer Elaine Hatzenbuhler and her Camaro intend to retire from NDSU. The department thanks her for many years of service and teaching the introductory laboratories.

Mathematics

Faculty receive honors, grants

The department was saddened by the death of longtime faculty member James Olsen, who died in June 2010. Olsen was a highly esteemed colleague.

Marian Bocea, assistant professor, received the 2010 College of Science and Mathematics Ambassadors Excellence Award and an International Congress of Mathematicians travel award.

Angie Hodge, assistant professor, received an NDSU Advance FORWARD Climate and Gender Equity Research grant, an Academy for Inquiry Based Learning grant and a Math Science Partnership grant from the North Dakota Department of Public Instruction. Maria Alfonseca, assistant professor, and Cristina Popovici, assistant professor, received NDSU Advance Forward course release grants. Sean Sather-Wagstaff, assistant professor, received an ND-EPSCoR Infrastructure Improvement Program seed grant and was inducted into the NDSU Tapestry of Diverse Talents.

Jason Boynton, assistant professor, joined the department in a tenure-track position. He earned his doctorate from Florida Atlantic University in 2006 and previously held a visiting position at NDSU. Lindsay Reiten joined the department as a lecturer. She earned her master's degree in mathematics education in 2008 from the University of Wisconsin-River Falls.

Graduate student Lindsay Merchant received a National Science Foundation, IEE and Deutscher Akademischer Austausch Dienst Central European Summer Research Institute Fellowship.

Physics

NDSU to host prestigious conference

In August, NDSU will host the 20th international conference on Discrete Simulation of Fluid Dynamics, the premier forum for researchers in the field. Conference chair Alexander Wagner, associate professor and graduate coordinator, is responsible for bringing the conference to Fargo.

Physics and mathematics double major Cody Gette received the prestigious Astronaut Scholarship Foundation scholarship for the 2010-11 academic year. His research on the laser processing of silicon-containing precursor films for flexible photovoltaic applications is under the supervision of Orv Swenson, associate professor at the NDSU Center for Nanoscale Science and Engineering.

Other faculty honors include Warren Christensen, assistant professor, was appointed vice-chair of the American Association of Physics Teachers' committee on Research in Physics Education; Sylvio May, associate professor, was appointed to the editorial board of Elsevier's bi-annual book series, "Advances in Planar Lipid Bilayers and Liposomes;" and Daniel Kroll, professor and department head, was named a member on the editorial board of the Physical Review E.

Psychology

Department hires new faculty

The department welcomed two new faculty members. Benjamin Balas is an assistant professor from Massachusetts Institute of Technology who studies face and object perception. His wife, Erin Conwell, from Brown University, is an assistant professor who studies language development.

Clayton Hilmert, assistant professor, received the College Award for Excellence in Teaching last year.

The department had a very good year for grant funding as it received several administrative supplements grants, as a result of federal stimulus efforts. Brian Ostafin, assistant professor, was funded by the National Institute on Alcohol Abuse and Alcoholism; and Mark McCourt, professor, led the effort to a renewal of an approximately $10 million grant from the National Institutes of Health to extend the work of several faculty members associated with the Center for Visual and Cognitive Neuroscience.

The department also acknowledges the success of recent graduates of our doctoral programs. Amber Koblitz is a post-doc at the National Cancer Institute; Dana Wallace is an assistant professor at Jamestown College; Jared Ladbury is an instructor at Minnesota State University Moorhead; and Lynette Leone and Hsin-Mei Sun have accepted research scientist positions in the NDSU Department of Psychology's Center for Visual and Cognitive Neuroscience.

Statistics

Scholarships awarded

The department awarded seniors Caitlin Dean and Rebecca Maier the H.P. Kuang Scholarship. Dean is working toward her bachelor's degree in statistics with a second major in psychology and minor in religion. Maier is working toward her bachelor's degree in mathematics/statistics with the pre-actuarial option and a minor in English.

From July 1, 2010, through the summer of 2011, the department will have had 15 graduate students completing either their master's or doctoral degrees. Several more students are expected to earn graduate degrees in statistics next year.

The department hosted a luncheon for area alumni and current graduate students in October 2010, and plans to host a similar event in the future.

Researchers win awards

Several NDSU researchers won awards at the CoatingsTech conference held March 14-16 in Rosemont, Ill. Sponsored by the American Coatings Association, the conference focuses on scientific aspects of coatings technology, including polymer chemistry, physical chemistry of coatings, pigments and colorants, and lifetime prediction.

Bret Chisholm, senior research scientist at the Center for Nanoscale Science and Engineering and adjunct professor in the Department of Coatings and Polymeric Materials (CPM) won the first place Roon award given for best technical paper for his paper, "Coatings derived from novel soybean oil-based polymers produced using living carbocationic polymerization." The paper was co-written by graduate student Samim Alam.

CPM graduate student Stacy Sommer received the first place Gordon award for best presentation for her paper, "The effect of pigmentation on siloxane-polyurethane coatings and their performance as fouling-release marine coatings."

CPM graduate students also won all three student poster presentation awards. Rajan Bodkhe won first place for "Novel amphiphilic siloxane-polyurethane fouling-release coatings using ring-opening equilibration polymerization and click chemistry," Xiao Pan received second place for "High biocontent thermosetting coatings from epoxidized sucrose esters of fatty acids" and TJ Nelson took third place for "Waterborne monomer-grafted sucrose ester resins." Dean Webster, professor of coatings and polymeric materials, is the adviser for Sommer and the three poster award winners.

CLASS NOTES

Wayne Lunsetter, BS '60, MS '63, chemistry, was named Outstanding Male Senior Volunteer for Marshall County in Minnesota. He is a retired Army officer and farmer who lives in Middle River, Minn.

Jerold Nelson, BS '61, psychology, retired after 40 years as a lawyer. Until his retirement, he maintained his office for 36 years in the Minneapolis Grain Exchange. He specialized in legal matters related to the cash grain industry and related commodity futures industry. He and his wife, Pamela, live in Vadnais Heights, Minn.

Elaine (Wieland) Kucera, BS '76, medical technology, was named director of laboratory services at St. Alexius Medical Center in Bismarck, N.D.

Dale DeKrey, BS '78, mathematics and chemistry, BS '82, MS '82, mechanical engineering, was promoted to associate director for operations and resources at the Fargo Veterans Administration Medical Center.

Annette (Schauer) Godtland, BS '80, mathematics, mathematics education and computer science, published her first book, "This Little Program Went to Market: Create, Deploy, Distribute, Sell and Market Software and More on the Internet at Little or No Cost to You." She is CEO of Godtland Software Corp. in Rochester, Minn.

Jeff Slaby, BS '84, zoology, MBA '04, business administration, was promoted to vice president of finance and human resources for CoreLink Administrative Solutions of Fargo.

Douglas H. Johnson, PhD '86, zoology, received the Aldo Leopold Memorial Award from the Wildlife Society. The honor recognizes distinguished service to wildlife conservation. Johnson, who was described in one nomination as "one of the true visionaries in the wildlife profession," has worked more than 40 years with the U.S. Geological Survey. His ongoing research includes statistical and biological issues on topics including ecology, conservation and habitat management. He is stationed at the Northern Prairie field office in St. Paul, Minn.

Tom Dubbels, BS '93, psychology and physical education, was named interim dean of student services at Minnesota State Community and Technical College in Moorhead. He has been a counselor on the campus since 1996.

Marsha Sovada, PhD '93, zoology, received the Wildlife Society's North Dakota Chapter Professional Award in recognition of her service to wildlife research and conservation as a U.S Geological Survey wildlife biologist for more than 30 years at the Northern Prairie Wildlife Research Center in Jamestown, N.D.

Cheri (Rasmussen) Gerken, BS '96, psychology, MS '00, child development and family science, was named program development coordinator for Fraser Ltd., Fargo. She is vice president of the board of directors for the Dorothy Day House of Hospitality in Moorhead. She lives in Moorhead.

Joan D. Beckman, BS '04, biotechnology, earned her doctorate in cancer biology from the University of Minnesota. She lives in Lauderdale, Minn., with her husband, Matthew Larson, BS '05, Spanish education.

Ashley Madson, BS '08, psychology, is an employer account specialist for Discovery Benefits in Fargo. She previously was an operations representative for C.H. Robinson Worldwide of Minneapolis.

Eric Hodgerson, BS '10, computer science, is a software test engineer at Red River Software in Fargo.

Matthew Peabody, BS '10, computer science and mathematics, joined High Point Networks of West Fargo as a systems engineer. He focuses on Microsoft products, storage consolidation and virtualization.

Tyler Williamson, BA '10, computer science, joined Results Unlimited of Fargo-Moorhead as a Web designer.

IN MEMORY

William Barr, 87, BS '44, chemistry

Elizabeth "BL" (Payne) Clark, 86, BS '64, mathematics

John R. Frost, 85, BS '47, chemistry

Robert Grorud, 89, BS '47, chemistry

Dr. Douglas Loberg, 61, BS '71, zoology

Donley "Buzz" Lotvedt, 69, BS '63, botany

Michael "Mick" Miller, 59, BA '74, zoology

Donald E. Pehrson, 82, MS '54, chemistry

Barbara (Bloom) Ranson, 60, MS '01, mathematics

Donald Sheldon, 87, MS '66, general science

Madeleine (Kaiser) Skogen, 98, BS '33, MS '60, mathematics education

Charles Wagner, 84, BS '49, mathematics

Richard Ward, 75, PhD '73, botany

DEVELOPMENT

College strives to modernize labs, classrooms

The College of Science and Mathematics has launched the "Classroom Modernization Project," an effort to improve the university's learning facilities. The project through the NDSU Development Foundation intends to raise funds to support various proposed remodeling plans in Stevens, Dunbar and Ladd Halls.

"These buildings were originally constructed at least 40 years ago, and many of the rooms are badly in need of upgrading – both from a functional as well as an aesthetic perspective," said Kevin McCaul, dean of science and mathematics. "We teach differently now than we did 40 years ago, relying more on team science and technology today. Such teaching requires a different classroom set-up. But it is also crucial that our science majors walk into a modern class or laboratory. We wish to engage those students and provide them the best preparation we possibly can."

Through the project, two rooms in Dunbar Hall are now being renovated. Dunbar 150, the original dean's office, is being converted to a laboratory for students studying biochemistry. A classroom, Dunbar 152, is undergoing remodeling to accommodate team learning activities and high-tech workstations.

Other possible renovations are planned for Stevens Hall if funds become available. The so-called "museum" in Stevens 107, which is filled with taxidermic animal mounts, could become a laboratory for human anatomy and physiology. Other examples include a botany classroom being renovated for team science laboratory work, classroom 231 being updated with modern technology and the refurbishment of Stevens Auditorium.

In Ladd Hall, plans call for the lecture hall to be restructured to meet the needs of organic chemistry education.

For more information on the project, contact the NDSU Development Foundation at 1-800-279-8971 or visit www.ndsufoundation.com.

DEVELOPMENT

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