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NORTH DAKOTA STATE UNIVERSITY

Summer 2010

<http://www.ndsu.edu/physics>

## Changing Times

“Change alone is unchanging” remains as true today at NDSU as it was 2500 years ago. Since the last newsletter, two major unanticipated events have occurred which will impact NDSU well into the future. The first is President Chapman’s October resignation, and the second is Senator Dorgan’s announcement in January that he will not seek reelection as North Dakota’s US Senator. These two men were responsible for much of the growth and many of the accomplishments at NDSU this last decade.

Much has been written about the events which led to President Chapman’s resignation. Major cost overruns on several University projects and bad judgment in process and execution definitely did occur, and, unfortunately, these mistakes have created budget problems not unlike those imposed on many public institutions in states severely impacted by the recent economic downturn. It is ironic that this has happened at a time when North Dakota’s economy is booming!

While this is a significant blemish on President Chapman’s record, it should not be forgotten that the accomplishments at NDSU over the last several years have been truly remarkable, and that there is much to be proud of. Mike Krueger, President of the NDSU Alumni Association, did a beautiful job of summarizing these accomplishments in an opinion piece entitled “NDSU’s Record is Stellar,” which appeared in the May 12 issue of the *Fargo Forum*. He has given us permission to reproduce the Op-Ed in its entirety in this newsletter; see the following article.

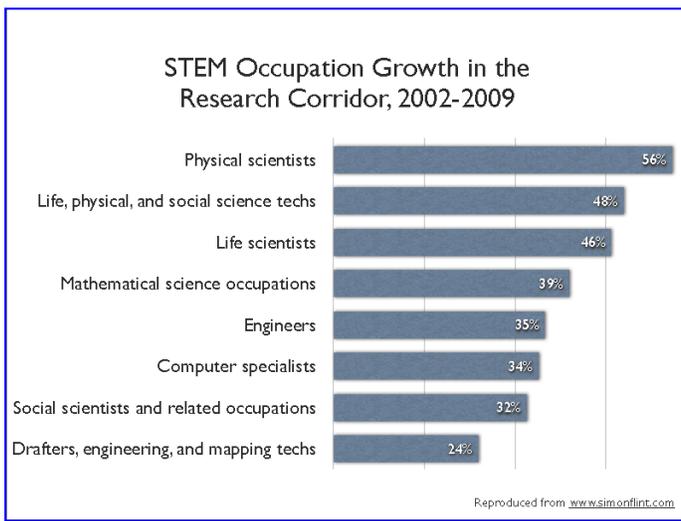
Our Department has also prospered—and I like to think improved dramatically—during Chapman’s Presidency. Alan Denton, the faculty member with the longest tenure at NDSU, arrived in 2000. The initiative of Alan Denton and Alexander Wagner—with strong support from the North Dakota EPSCoR New Faculty Start-Up Program and the Administration—to create a center of excellence in Computational Physics, with an emphasis on modeling of soft materials, resulted in the recruitment of three new faculty in 2005. Subsequently, President Chapman’s STEM-Education initiative resulted in two Physics Education positions, and our close affiliation with the Interdisciplinary Graduate Program in Materials and Nanotechnology has greatly strengthened our program in Experimental Physics. As a result, in autumn, we will have a total of twelve faculty. We expect new teaching initiatives to continue to improve our curriculum, and accomplishments such as the recent Fellowship in Physics and Society grant awarded to our chapter of the Society of Physics Students, Aaron Feickert’s Department of Defense SMART Scholarship (first ever for a student from North Dakota!), and Cody Gette’s Astronaut Scholarship Foundation Scholarship—all of which are described elsewhere in this newsletter—are indications of the strength of our program. A number of recent graduates have gone on to attend graduate school in institutions such as Ohio State University, the University of Minnesota, SUNY Stony Brook, Carnegie Mellon University, and Cornell. I am very happy with our accomplishments, and look forward to continuing to improve the program.

North Dakota Senator Dorgan’s decision to not stand for reelection is the second major unanticipated event this last year. It would be hard to exaggerate Senator Dorgan’s contributions to the research infrastructure of NDSU and the Red River Valley. As a senior member of the U.S. Senate’s Appropriations Committee, Dorgan has worked vigorously to increase high-tech research, development, and commercialization in North Dakota. He has directed more than \$694 million in federal investments to Red River Valley Research Corridor (RRVRC) activities since 2002.

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A 2006 economic impact study of the RRVRC has shown that the Research Corridor initiative has generated \$759 million in positive economic impact and added 10,600 jobs to the regional economy. In October 2008, Senator Dorgan set a goal of doubling the Red River Valley Research Corridor job impact by 2015, which would bring the total amount of jobs created to 20,000. These initiatives have helped make the North Dakota research industry the fastest-growing in the nation.

Regional growth in the Corridor science and technology-based economy is translating into more science, technology, engineering, and mathematics job opportunities in the Red River Valley. The STEM category of occupations (see chart) has added more than 2,200 jobs, for 35% growth since 2002. This is well ahead of the 8% growth in the nation for the same occupation group.



These and other initiatives have helped to develop NDSU into a world-class research institution. A very recent development in which Senator Dorgan played a major role is the expansion of the Center for Computationally Assisted Science and Technology (CCAST), formerly the Center for High Performance Computing. It is in the early stages of building a significant computational capability that will serve NDSU's faculty, staff, and students and provide a regional resource in applications-driven computation to further partnerships with the federal, private, and university sectors. CCAST is a unit within the Research, Creative Activities, and Technology Transfer (RCATT) Division of the University. The initial phase is funded by \$18+ million in federal funding from the Department of Energy, but as the Center grows, it will be expected to generate its own operating revenue and margin. CCAST will build upon and, where appropriate, partner with other university departments and centers on projects. There is currently a national search ongoing for a Director for this Center.

President Chapman's successor has already been chosen (see article on p. 3), and it currently looks like North Dakota's current governor, John Hoeven, will win the election for Senator. You will have to wait until next year to find out what this means for NDSU, our College, and the Department. As alumni, however, I sincerely hope that you will take an active role in helping and influencing future developments at NDSU. Your support is essential if NDSU is to fulfill its potential as an outstanding land-grant institution. I am sure that Mike Krueger would be more than happy to hear from you. Mike has also initiated monthly messages to help provide you with the most accurate information about issues concerning NDSU. His first message is reproduced at the end of this newsletter. If you would like to receive these messages on a regular basis, please send an e-mail to [Office@ndsualumni.com](mailto:Office@ndsualumni.com).

We are particularly interested in developing a closer relationship with our Physics alumni, and want to use this newsletter as a venue for you to communicate information about your life, career, and family to friends from your time at NDSU. Please provide the department with news for our next newsletter.

Finally, I would like to personally thank all of you who have contributed to one of the department funds that have enabled us to recognize outstanding undergraduate scholarship. Further information regarding these funds and scholarships are provided in the body of this newsletter. Please continue to provide support for these scholarship funds. I encourage all of you to come by the department when you are in the area. We would enjoy showing you around and hearing about your life after NDSU.

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*NDSU Department of Physics Newsletter*  
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# **NDSU's Record is Stellar**

**Mike Krueger**

President, NDSU Alumni Association  
Fargo *Forum*, May 12, 2010

The news from NDSU the past six months has not been very positive. Cost overruns on various projects and an audit report that pointed out mistakes in the funding process and execution have given people plenty to talk about. I've been waiting and watching since President Chapman resigned last fall for someone – anyone – to respond to all of the criticism, sniping and frankly cheap shots that have flowed towards NDSU in the months since. What happened to all of us? Was no politician, business person, or anyone else willing to defend the greatest decade of growth and accomplishment in the university's history?

Should I be embarrassed that NDSU's enrollment grew from 9,710 to 14,189 in 10 years? I don't think so. Should I be embarrassed that research dollars invested at NDSU (which means North Dakota) grew from \$44 million in 1999 to \$115.5 million in 2009? I don't think so. Should I be embarrassed because NDSU made the transition to Division I athletics with barely a hitch and brought national notoriety to NDSU (which means North Dakota)? Should I be embarrassed because NDSU is now recognized as one of the top 100 research universities in the nation? Should I be embarrassed because NDSU (and North Dakota) now has one of the best business college facilities in the nation? Should I be embarrassed because NDSU has a downtown campus with three premier facilities (Barry Hall, Klai Hall, and Renaissance) that bring 3,000 to 4,000 students and staff to downtown Fargo every day and that this has helped to revitalize downtown Fargo? Should I be embarrassed that NDSU now has 44 doctoral programs compared to 18 in 1999 and that some have already attained national recognition? Should I be embarrassed because NDSU has greatly expanded crop variety and disease research programs to further assist agriculture, North Dakota's number one industry? Should I be embarrassed because the university president now has a decent home that will also serve as a meeting and entertainment facility and that less than one percent of the cost came from appropriated dollars? Should I be embarrassed because the rapid growth at NDSU has turned the university into an economic powerhouse in this region by creating high paying jobs and stimulating economic activity? A resounding no to all of the above.

There are some things I think I should be embarrassed about. Some of these accomplishments happened with little support from the state. NDSU's donors are the quiet, unsung heroes responsible for much of our success. In fact, these accomplishments would not have happened without leaders who were willing to step out and garner private support and encourage private and public partnerships. The legislature and Board of Higher Education to this day continue to pay NDSU less per student in state funding than any other state college or university. State investment per student at NDSU continues to decline.

It's time we move beyond feeling sorry, angry or embarrassed that NDSU has been so incredibly successful over the last ten years. The mistakes that were made were insignificant compared to the total accomplishments and contributions made, and – more importantly – those mistakes have been corrected. The challenge from now forward is to do all we can to foster, not impede, the continued growth and expansion of NDSU and every other institution of higher education in this state. We all win by doing so. It's easy to talk about making things happen. It is quite another thing to actually make things happen. Many dedicated and hard working leaders at NDSU made it happen. North Dakota should work hard to find, retain and cherish leaders with that ability. They are few and far between.

I am a native of North Dakota who has lived on both sides of the state. I am a graduate of NDSU. I am an ardent supporter of NDSU. I am proud to be the president of the NDSU Alumni Association. Go Bison!

## **Dean Bresciani Named New NDSU President**

On May 24, the ND State Board of Higher Education voted unanimously to hire Dean Bresciani as 14<sup>th</sup> President of North Dakota State University. The other finalists were John Gardner, a vice president at Washington State University, and Gary Miller, provost and vice president at Wichita State University.

Bresciani, 50, was vice president for student affairs at Texas A&M from 2004-08, where he was an adjunct professor in Educational Administration and Human Resources Development. He previously served as interim vice chancellor for student affairs at the University of North Carolina from 2002-04.

# Department News

## New Faculty



**LANDON BLADOW**  
**ASSISTANT PROFESSOR OF PRACTICE OF PHYSICS**  
**NDSU APPOINTMENT FALL 2009**

I am originally from Hankinson, in southeast ND, and I received both my B.S. (Chemistry, 2005) and Ph.D. (Physical Chemistry, 2009) degrees from NDSU. My teaching duties include various introductory physics courses. For spring 2010, I developed an online version of Physics 120 (Fundamentals of Physics, our single-semester liberal arts physics course) that was well-received by the students who completed it.

Although my appointment involves mostly teaching, my research interests are in quantum chemistry and the computational modeling of energy disposal in chemical reactions. We use approximate quantum mechanical calculations to describe the electronic structure of molecules along a reaction path of interest. Subsequently, a mixed quantum-classical dynamical method for motion along the reaction path is used to predict product energy partitioning, including vibrational quantum state distributions.



**WARREN CHRISTENSEN**  
**ASSISTANT PROFESSOR OF PHYSICS AND SCHOOL OF EDUCATION**  
**NDSU APPOINTMENT FALL 2009**

Warren Christensen came to NDSU from the University of Maine where he served as a Postdoctoral Research Associate for the Research In STEM Education Center. He received his PhD from the Department of Physics Education Research at Iowa State University in 2007. He completed his undergraduate studies at the University of Central Missouri and grew up in Omaha, NE.

Warren is the 2<sup>nd</sup> researcher (joining Mila Kryjevskaja) in the Department of Physics whose field of study is the learning and teaching of physics. Physics Education Research has been steadily growing as a research field within physics over the past 30 years, conducting empirical research that aims to demonstrably improve student understanding. His current research interests are exploring students' understanding of mathematics in the physics classroom and how they apply (or don't apply) ideas taught in calculus to do physics problems, as well as research-based curriculum development, particularly for upper-division courses in thermodynamics and statistical mechanics.

I thoroughly enjoyed teaching University Physics (the calculus-based course for majors, engineers, and chemists). I strive to make the large lecture course as interactive as possible using a number of research-supported pedagogical techniques. Most notably, I model a lot of the classroom activities on Eric Mazur's *Peer Instruction*, where a significant portion of class time is spent with students discussing conceptual physics questions and responding using the Personal Response System (clickers).



**ERIK HOBBIE**  
**PROFESSOR OF PHYSICS AND COATINGS & POLYMERIC MATERIALS**  
**NDSU APPOINTMENT FALL 2009**

Erik Hobbie received his PhD (1990) in Physics from the University of Minnesota. He was a National Research Council Postdoctoral Fellow in Polymer Science at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, from 1990 to 1992 and was a Senior Research Scientist in the Polymers Division at NIST until joining the faculty at NDSU in the summer of 2009. His research at NDSU is focused on engineering new materials from polymers and nanoparticles. He is Director of NDSU's Interdisciplinary Graduate Program in Materials and Nanotechnology.

## **Materials and Nanotechnology Program**

### **Erik Hobbie**

The Materials and Nanotechnology (MNT) program at NDSU is poised for new growth. In addition to two new faculty hires with primary appointments in Physics, the University has received state funding for the establishment of a new Center of Excellence. The program will be housed in Appareo, a new building in the NDSU Research and Technology Park (RTP). Materials and Nanotechnology is a well-established field comprised of research and development activities currently experiencing rapid growth within governmental, academic, and commercial sectors. At NDSU, there is a demonstrated focus on “soft” materials, including polymers, flexible electronics, and pharmaceuticals. Departments engaged in this type of research include Physics, Chemistry and Biochemistry, Coatings and Polymeric Materials, and Mechanical Engineering.

The enhancement grant will provide MNT with laboratory space that will enable NDSU scientists to work on research problems that are commercially relevant and important to the private sector. In academia or industry, new materials or new technologies result from strong research and development programs. NDSU is positioned to move discoveries made by its MNT Center through NDSU's technology commercialization “value chain” to the private sector, creating more opportunities for economic development. The MNT program will work closely with other allied research units within NDSU (such as the Economic Development Centers of Excellence) also located in the NDSU RTP. This combination of well-focused expertise within the NDSU academic units, the existence of the Center for Nanoscale Science & Engineering (CNSE) and NDSU's Economic Development Centers of Excellence, coupled with the entrepreneurial focus of the NDSU RTP, make the MNT Center ideally suited to developing new ideas and concepts in nanomaterials that can be translated directly into new applications.

The MNT building will become the home of the research and development facilities of at least four research-active scientists. The research infrastructure in this facility will grow within the first years to include over \$1.2 million in state-of-the-art equipment. Some of this space will be utilized to allow other MNT scientists to enhance their research programs, as research space is a limiting factor in many departments on campus. The space is designed to foster truly interdisciplinary work without the traditional discipline compartmentalization that often contributes to a narrow focus in traditional research-based departments. Within the first year, the facility will enhance the probability of successful competitive research grants written by the members, as they will have the ability to carry out research projects and programs that would be impossible in more traditional department settings.

The finished space (8,500 square feet on the building's second floor) will represent a state-of-the art facility for higher education and research. The facility will include office space for the program, laboratory space for at least four faculty members and their research teams, office space for graduate assistants, and a conference room. It will play a critical role in training advanced technical personnel and will contribute to economic development in North Dakota through the establishment of small startup companies and by providing a critical source of skilled professionals for larger companies looking to establish technical facilities in the state of North Dakota. The facility will include two wet chemistry labs, a synthesis lab, and four instrumentation labs specializing in the characterization of materials related to “soft” nanotechnology, with an emphasis on applications related to energy and biomedical engineering. In the model of existing facilities in CNSE, the lab space will be shared and open, offering new research capabilities to the entire campus community. Student recruitment efforts have already been initiated and have a specific regional focus, including the Tri-College area, since these students represent a high-quality resource with a high potential for remaining in the region after completing an advanced degree.

# Beijing – Rome – Fargo

## An International Conference Comes to Fargo

Alexander Wagner

We will hold a week-long international conference at the main NDSU campus on August 8-12, 2011. This will be the 20th international conference on Discrete Simulation of Fluid Dynamics (DSFD). Most recently this conference has been held in Rome (2010) and Beijing (2009). Previous locations of the conference in the US were Boston, Santa Fe, Princeton, and Los Alamos.

This list of locations may well remind you of the “Moscow, London, Paris, Fargo” t-shirts and fridge magnets, which derive their humor from the unlikely combination of locations. We have the opportunity to make such a combination of locations a reality. We have been selected to hold this successful conference series in Fargo. Our bid won partly because Alexander Wagner is highly trusted by the community. The trust of the community was also evidenced when he was elected the chair of the International Scientific Committee for this conference in 2008. The most recent conference in Rome this summer attracted 170+ participants from 30+ countries. This was a record participation for this conference series. Other recent conferences attracted around 100+ participants. The conference attracts researchers from a large variety of fields including Mathematics, Physics, Materials Science, Mechanical Engineering, Computer Science, Chemical Engineering, and Medicine. What brings the researchers of these different fields together is their interest in complex flow phenomena. These complex flow phenomena differ from simple flow phenomena by including some additional physical features, like phase-boundaries, suspended particles (like red blood cells), small scale Physics (i.e. high Knudson numbers), or tortuous boundaries as in flow through soil. For these studies innovative simulation algorithms are required. The DSFD conference is the premiere venue for presenting and discussing applications of such new algorithms. These algorithms include Lattice Gas, Lattice Boltzmann, Multi-Particle-Collision Dynamics, Dissipative Particle Dynamics, Molecular Dynamics, and many more. More information on the conference series can be found at <http://dsfd.org>.

The local organizing committee includes many of our local Physics faculty: Alan Denton, Eric Hobbie, Thomas Ihle, Daniel Kroll, and Sylvio May. We hope that after next summer the DSFD conference will have helped to significantly enhance NDSU's image in the US and abroad, and that, as a result, more students will be attracted to NDSU in general and the Physics Department in particular.



Moscow.



London.



Paris.



Fargo.

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## German Professor Visits Department

Sylvio May

In March 2010, Prof. Alfred Fahr, Head of the Department for Pharmaceutical Technology at the Friedrich-Schiller University of Jena in Germany, spent five days at the NDSU Department of Physics. His trip to Fargo was supported by Germany's Federal Ministry of Education and Research in order to initiate a cooperation with the group of Sylvio May. Prof. Fahr, whose current work revolves around the delivery of drugs to cancerous tissue, gave a talk entitled "Liposomal formulations of photosensitizers" at the Department of Pharmaceutical Sciences at NDSU. The talk was well-attended, and, yes, even some physics people did not miss this opportunity.

# Instructional Development Grant

## Two-Slit Interference: The Essential Quantum Paradox

Orven Swenson, with Alan Denton

Last winter, the Department was awarded an Instructional Development Grant from the University Senate Faculty Development Committee to purchase a TeachSpin "Two-Slit Interference, One Photon at a Time" instrument. The experiment/demonstration is based on Young's classic double-slit interference experiment, but with single-photon counting. The remarkable property demonstrated by our new toy is that a beam of light made so dim that photons pass one-at-a-time through the slits also exhibits interference. This startling observation, which defies the classical notion that a single photon must pass through either one slit or the other, challenges students' preconceptions and facilitates further discussion of quantum phenomena. The new instrument will enhance several courses, from Fundamentals of Physics through graduate Quantum Mechanics. The interference experiment is also part of our ongoing development of embedded laboratories in our Modern Physics I and II courses, to which we also recently added a "Muon Lifetime" experiment. We welcome alumni feedback on experiments that you found most useful for understanding physics or have found exciting in your careers.

The new two-slit interference instrument also helped to enlighten groups of middle and high school students who visited the Department during the ND State Science Fair and the NATURE Summer Camp. Nurturing American Tribal Undergraduate Research and Education (NATURE) is a ND EPSCoR-sponsored education and outreach program that aims to improve science, technology, engineering, and mathematics education among North Dakota tribal college and high school students. In mid-June, two students from the NATURE Summer Camp, Harold Counts (Turtle Mountain Community College) and Craig Brown (Spirit Lake Nation), returned to the Department to conduct a short research project on light interference, under the supervision of Alan Denton and Paul Omernik.

## Department Awards and Scholarships

**Eivind Horvik Memorial Award:** A cash award of \$150 plus a recognition certificate for the best overall performance in the calculus-based physics sequence. The recipient's name is recorded on a permanent plaque in the Physics Department office. Funds are provided by friends and associates of Eivind Horvik.

**2010 Horvik Award Winners:** James Bickert & Matthew Semler

**Sinha Family Scholarship:** Initial funds to support this endowment in the amount of \$5,000 were provided by Dr. and Mrs. Mahendra K. Sinha in memory of Mr. and Mrs. Pratap Narain, the parents of Dr. Mahendra K. Sinha, Emeritus Professor of Physics. It is understood that the recipient of this award will meet the following preferred criteria: (1) Be properly enrolled at North Dakota State University at the time of application and disbursement. (2) Be a Physics major with Junior or Senior standing. (3) Special consideration should be given by the selection committee to the applicant's academic merit and financial need.

**2010 Sinha Scholarship Winners:** William Casper & Aaron Feickert

**Physics Scholarship Fund:** The purpose of this endowment is to provide funding for scholarships to deserving undergraduate students.

*The Department of Physics wishes to thank all donors who have contributed to our scholarship programs. You are making a significant difference in the lives of our students.*

### 2009-2010 Donors

John and Janice Daly  
Darrell and Carol Strobel  
Michael Reich and Cherish Bauer-Reich  
Orven and Deborah Swenson  
Anne and Alan Denton

Harold and Anne Korb  
Daniel M. Kroll  
Yongli and Tingting Ning  
Carsten A. Wagner  
Dennis and Sandra Whitson

# Physics Alumna Christina Keller Receives Distinguished Alumni Award

Alan Denton

Dr. Christina (Tina) Keller, a graduate of the Department of Physics, visited NDSU on April 28-29 to receive the annual Distinguished Alumni Award of the College of Science and Mathematics. A native of Minnesota, Dr. Keller obtained her B.S. in Physics from NDSU in 1984. She went on to earn her Master's (1986) and Ph.D. (1988) degrees (also from NDSU) for theoretical research on the peculiar properties of quantum liquids at low temperatures. While a Bison, Dr. Keller also excelled on the basketball court. A four-year letter winner, she was twice named Academic All-North Central Conference. Her secret weapon may have been a deep understanding of inelastic collisions, spin, and projectile motion.

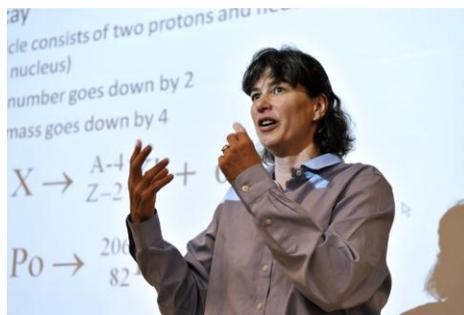


Photo by Dan Koeck

From Fargo, Dr. Keller moved to Vermillion, SD, where she is now Associate Professor of Physics and Associate Dean of Administration at the University of South Dakota. Her broad research interests include theoretical condensed matter physics, physics education, and nuclear and particle physics. In recent years, Dr. Keller's research has gone underground—4850 feet underground—in the Homestake gold mine in Lead, SD. Following its conversion to the "Deep Underground Science and Engineering Laboratory" (DUSEL), the Homestake mine—the deepest in North America with rooms at 8000 feet—will be ideally suited for experiments that demand extremely low cosmogenic backgrounds.

After accepting the prestigious Distinguished Alumni Award from Dean Kevin McCaul, Dr. Keller spoke to a packed Physics 120 lecture hall about her latest research. Following an entertaining overview of the Standard Model of particle physics, including the history of the neutrino, she outlined exciting plans for collaborative experiments in search of such rare beasts as neutrinoless double-beta decay and relic dark matter. Later the same day, she visited with students, faculty, and staff at a reception in her honor in South Engineering. We will follow with keen interest the progress of the DUSEL project (<http://www.dusel.org>) and hope Dr. Keller can soon return to her alma mater with an update.

## Alumni Contribution

**Jay Ihry (B.S. Winter 2003)** received his Ph.D. from the University of North Carolina at Chapel Hill and started his new career at Metron, Inc., in May 2009. He states "the blend of math, physics, and computing experience I gained at NDSU helped separate me from the other applicants."

## 2009 – 2010 Graduates

**Aaron Feickert (B.S. Spring 2010)** graduated with a double major in Physics and Mathematics. As part of his SMART scholarship, he will complete a one-year fellowship doing atomic clock research with the Navy before attending graduate school. Aaron enjoys rock climbing, bicycling, and having fun outdoors.

**Joseph Miller (B.S. Spring 2010)** graduated with a major in Physics and a minor in Spanish. He has already started working toward a PhD in the Materials and Nanotechnology program at NDSU. His research is with Professor Hobbie and is directed at understanding how the parameters that control polymer mediated self-assembly influence the photo-physical properties of single crystal silicon quantum dots. Joe enjoys teaching physics and working with undergraduate students.

**Jack Nagel (B.S. Spring 2010)** graduated with a major in Physics and a minor in Mathematics. He is originally from and attended school in Wyndmere, ND. During his time at NDSU, Jack has developed an interest in law and public policy that parallels his interest in physics, and after graduation he will be attending law school, although he

has not yet decided where that will be. He hopes to be able to apply his undergraduate training in physics to relevant legal issues, such as patent and trademark law, and potentially in the arena of public policy.

**William Casper (B.S. Winter 2009)** graduated with a double major in Physics and Mathematics. He is working as a graduate student intern in the Computational Physics Group CCS-2 at Los Alamos National Laboratory (LANL) for the summer. He'll be working with his mentors, Balu Nadiga and Phil Jones, in the Parallel Ocean Program (POP) doing data simulation studies. After this summer, he may stay on at LANL to do some additional work in a similar area for up to a year. After LANL, he intends to go to graduate school to obtain a PhD in Mathematics.

**Christopher Olson (B.S. Winter 2009)** graduated with a major in Physics. He is currently working with Dr. Konstantin Pokhodnya at NDSU's Center for Nanoscale Science and Engineering, studying a new class of organic/inorganic hybrid molecule-based magnets. Chris has successfully completed the synthesis, spectroscopic and magnetic characterization of these new materials, and is planning to supplement his current experimental results with simulations, with the goal of better understanding the link between the structural dimensionality and magnetic exchange. He intends to earn a Master's Degree in the Materials and Nanotechnology program at NDSU.

**Christopher Wallin (B.S. Summer 2009)** graduated with majors in Economics, Electrical Engineering, Mathematics, and Physics—as well as a minor in Chemistry. He had a difficult time choosing between the University of Chicago and Cornell for graduate school: "My decision to go Cornell was mostly based on future research opportunities (probably nanoscience), my conversations with the faculty, the interdisciplinary nature of the program, and the program's ability to be tailored to my needs and interests. I also felt like Ithaca was more livable for me when compared to Chicago. I will be definitely taking advantage of the ample outdoor opportunities around Ithaca."

**Marissa Detschel (M.S. Spring 2009)** graduated with a Master's Degree in Physics. She is working for a defense contracting company called Defense Group Inc. as a research support analyst. She'll be working with a part of the Department of Homeland Security called the Domestic Nuclear Detection Office (DNDO). The DNDO is a jointly staffed office established April 15, 2005, to improve the Nation's capability to detect and report unauthorized attempts to import, possess, store, develop, or transport nuclear or radiological material for use against the Nation, and to further enhance this capability over time. As a research support analyst, she will primarily be doing project management-type work that will utilize her background in physics and radiation measurements.

## **Undergraduate Life**

### **Society of Physics Students**

**Aaron Feickert**

This year, the NDSU chapter of the Society of Physics Students (SPS) received the Fellowship in Physics and Society award from the national SPS for the upcoming year.

Our group submitted a grant proposal, titled "BALLOO: Buoyant Atmospheric Launchable Low-Orbit Observatory," to construct and launch a balloon-based camera and observational apparatus. The device would be used to take aerial and ground photos in both visible and infrared light, with the hope of using this data to help analyze flood progressions and heat patterns. We would also be able to take a variety of atmospheric data throughout the balloon's ascent and descent.

Our award totals \$4000 and includes funding for the apparatus, as well as travel funding to present a report of our findings at a summer conference of the American Astronomical Society in Boston next year. The award is intended to encourage SPS chapters to make physics accessible to the public in an exciting way. As part of this goal, we will be keeping a careful log of our progress and making this information about the project available to the public. We are extremely excited to have received this award, and look forward to the progress we'll make in the upcoming year.

## Physics Major Awarded SMART Scholarship

Aaron Feickert

I was very fortunate this year to have received the Department of Defense's SMART (Science, Mathematics, and Research for Transformation) scholarship. Due to a growing number of Defense scientists, engineers, and mathematicians retiring, the government is actively seeking out folks with knowledge in these areas to fill their shoes. This scholarship is one part of that effort.

The scholarship is available to both undergraduate and graduate students of any year. Once you receive the scholarship, Defense will fund your tuition, book fees, and health insurance for the remainder of your degree. You also receive a generous yearly stipend to help you offset other living costs.

In exchange for funding your degree, the scholarship also stipulates that you provide one year of employment service with Defense for every year you receive the award. While I'll be putting in my year of service with the U.S. Naval Observatory, there are many labs throughout the military for which you could work.

I was told that, while over 16,000 students began the application process in the year for which I applied, only about 3000 completed it. Out of those, about 300 were awarded the scholarship. The folks in charge were surprised that these numbers were so low. This means that if you finish the application, you have a pretty decent chance of receiving the award!

I'd certainly encourage anyone studying a discipline related to science, mathematics, or engineering to apply for the award. It's a great opportunity to get hands-on experience solving real problems to help out the country. Details are available at <http://www.asee.org/smart>.

## Physics Major Awarded Astronaut Foundation Scholarship

Orven Swenson

Cody Gette, who completed his Junior year as a Physics major and Math minor, has been selected to receive the 2010-2011 Astronaut Scholarship Foundation Scholarship at NDSU. The Astronaut Scholarship Foundation was created by astronaut members of Mercury Seven to help the United States retain its world leadership in science and technology. The Astronaut Scholarship Foundation Committee selects one recipient from each of 20 cooperating universities to receive a \$10,000 scholarship annually. The selection is based on motivation, imagination, and exceptional performance exhibited by students in the science or engineering field of their major. Cody is involved with laser processing of silicon-containing precursor films to form crystalline silicon on temperature-sensitive substrates such as glass, polymer, or stainless steel for flexible photovoltaic applications at the NDSU Center for Nanoscale Science and Engineering (CNSE).

### NDSU Facts

From the NDSU Alumni Association



from the Alumni Association President

Greetings,

As NDSU graduates, many of us are often asked questions about North Dakota State University and we may not know the answers. It's important to keep you informed with the most accurate information so you can respond to questions or issues concerning NDSU. This e-mail is the start of a series of brief and informative facts about NDSU. If you like it, please forward to others. We all have a responsibility to be ambassadors for our alma mater. If there are other topics you would like to learn about please let me know.

- NDSU Enrollment totaled 14,189 in the Fall of 2009. We expect that number will increase again this Fall.
- Tuition costs, per semester, 2010-2011:
  - In state \$2,819
  - Minnesota Resident \$2,953 (reciprocity, not yet finalized)
  - Other non-resident \$7,527
  - including international
  - Alumni incentive \$4,229 (for children of NDSU alumni who live out of North Dakota and Minnesota)
 Full details at: [www.ndsu.edu/prospective\\_students](http://www.ndsu.edu/prospective_students)
- NDSU's total budget in the last fiscal year was just more than \$329 million.
- The state contributed approximately \$98 million, or 30 percent of the NDSU budget.

*Go Bison!*

Mike Krueger '71  
 President, NDSU Alumni Association  
 Office@ndsualumni.com

## Your continued financial support is requested to keep the scholarship and awards programs growing.

<p><b>Physics Development Fund</b></p> <p>Name: _____</p> <p>Enclosed is my gift of \$_____.</p> <p>Please detach or copy and mail with your gift to:          NDSU Development Foundation          1241 N. University Dr.          Fargo, ND 58102</p> <p>Make checks payable to:          NDSU Development Foundation</p> <p>Please designate your gift to one of the following:</p> <p><input type="checkbox"/> Eivind Horvik Memorial Award</p> <p><input type="checkbox"/> Sinha Family Scholarship</p> <p><input type="checkbox"/> Physics Scholarship Fund</p> <p>Thank you!</p>	<p>Payment options:</p> <p><input type="checkbox"/> Check enclosed #_____</p> <p><input type="checkbox"/> Charge my credit card</p> <p style="padding-left: 20px;"><input type="checkbox"/> Visa      <input type="checkbox"/> MasterCard      <input type="checkbox"/> Discover</p> <p>Name on Card: _____</p> <p>Card No.: _____</p> <p>Expiration Date: _____</p> <p>Billing Address: _____</p> <p>_____</p> <p>Phone: _____</p> <p>Signature: _____</p>
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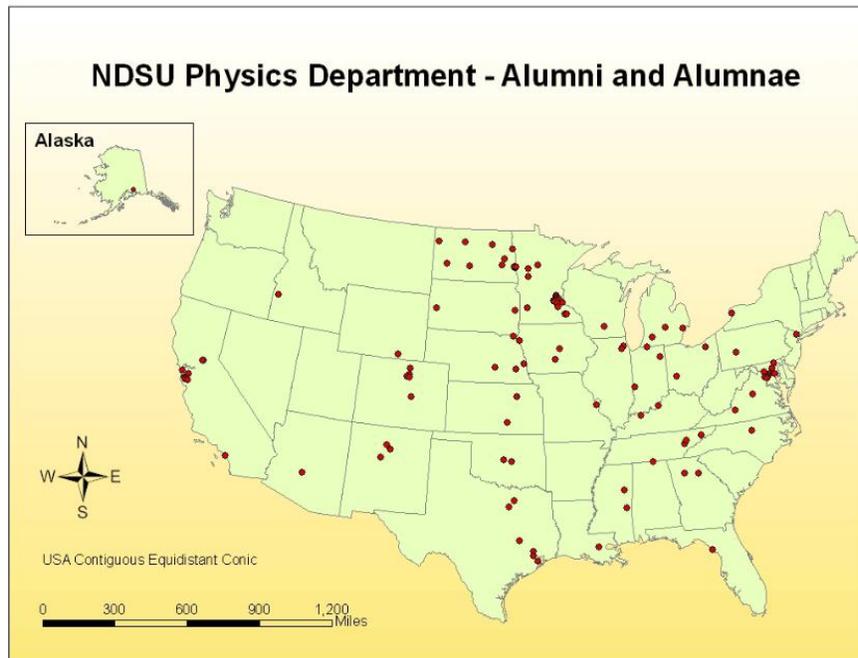
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Graduates from the NDSU Physics Department are scattered throughout the United States and across the globe. We are eager to hear from our alums. Please send an email or note to update us on what's happening in your world.

Email updates to:  
[patty.hartsoch@ndsu.edu](mailto:patty.hartsoch@ndsu.edu)