

August 27, 2004

Dear Friends and Alumni,

Greetings. Another year has passed and several exciting changes have occurred in the physics program this past year. I would like to take this opportunity to share with you some of these events and tell you a little bit about some of our current students.

### **Astronomy/Earth Day Speaker**

Our Astronomy/Earth Day speaker this year was Dr. Albert Haldemann, the Deputy Project Scientist for the Mars Rover Expedition. Dr. Haldemann's Ph.D. is in Planetary Science from Caltech and perfectly blends together physics and earth sciences. A component of his dissertation involved the radar characterization of candidate landing sites for Mars Pathfinder. This graduate work landed him a postdoctoral position on the Mars Pathfinder Science Team in the Surface Material Properties Science Operations Group one month before the Pathfinder landing. The Planetary Radar Group at the Jet Propulsion Laboratory (JPL) also offered Haldemann a position, which he accepted. After Pathfinder, Haldemann traded his Sojourner experience for work with JPL's Field Integrated Development and Operations Rover (FIDO). He was responsible for test, calibration and integration of the science instrument payload on that prototype rover, a payload that simulated the Mars Exploration Rover (MER) payload. He began his MER project duties in the fall of 2000. Haldemann participated in several field deployments of FIDO, including the deployment to northern Arizona that was used to train the MER science team in remote robotic field geology.

Dr. Haldemann's visit to USD began with his keynote lecture entitled "Spirit and Opportunity on Mars" in which he discussed the many exciting findings from the current Mars missions. During the second day of his visit, he spoke with students in our programs, presented a lecture to one of our classes, and visited two of the local elementary schools. The elementary school visits

were a particular success and I think Dr. Haldemann may have inspired a new generation of space explorers.



*Photo Credit: The Volante*

## **New Faculty Member**

As I mentioned in our 2003 newsletter, my move to the Dean's Office allowed us to hire a new physicist in the department. After a very competitive search, we hired Dr. Yongchen Sun as a third tenure-track physicist in the department. Dr. Sun received his PhD from Montana State University in 1993 and spent three years as a post-doc at the University of Georgia. He returned to Montana State in 1996 and has held the rank of Research Associate Professor at Montana State since 1997. Dr. Sun's research interests include Solid State Materials for Lasers, Phosphors and Scintillators, Optical Memory and Signal Processing Device Development. These research interests overlap very closely with the photodynamics group in the Department of Chemistry at the U and both physics and chemistry are very excited about the opportunities for collaboration this hire presents. Dr. Sun is very widely published, with over thirty publications in journals that include *Physical Review B*, the *Journal of Luminescence*, *Proceedings of SPIE*, and the *Journal of Modern Optics*. He has also presented numerous invited papers at both national and international conferences and holds a patent. The Department enthusiastically welcomes Dr. Sun to our program.

## **Summer Activities**

The Masters of Natural Science program continues to grow and graduated its first student last summer with an emphasis in physics. We expect continued growth of this program, particularly in response to No Child Left Behind legislation that emphasizes content knowledge for K-12 teachers. This summer, the program will offer two modules in physics, two modules in chemistry, one module in mathematics and an interdisciplinary module with a focus on "Light."

Members of the physics program have also contributed activities to the Lawrence Brothers Science Camp. This camp was initially funded through a very generous gift from the Lawrence family and was first announced at the Lawrence Brothers Celebration in 2001. This summer will be the third year of the camp. Each summer a different theme is chosen for the camp and activities are planned around that theme. Past year's themes have included "Vision" and "The Science of Sports." In a nod to popular culture, this year's camp is entitled "CSI at the U." If any of you know young people (grades 7-9) who may be interested in attending this camp, you should direct them to [www.usd.edu/lbf](http://www.usd.edu/lbf) for more information.

The close approach of Mars last summer also provided opportunities for members of the physics program to provide outreach activities to the local community. Several members of the department provided interviews to local newspapers and radio stations. Dr. Keating hosted several public viewings that allowed the public to use the department's telescopes to provide a superb view of Mars during this period of very close approach.

## **Graduating Seniors**

While this year's graduating class is not nearly as large as last year's, it is somewhat larger than normal. Kyle Whitely graduated in December with a double major in physics and mathematics. He is currently seeking employment. During spring commencement in May, we had three students graduate. Anna Van Duzer earned a major in mathematics in addition to her physics major and graduated with honors after completing the requirements for the honors program. Her honors thesis was entitled "Blind Search for Low Mass Halos in the Local Universe" and represented work she had completed while at Cornell University as

part of a Research Experiences for Undergraduates. This fall, she will be entering Creighton Law School with a full scholarship. Tim Margheim also earned a major in mathematics in addition to the physics major and graduated with honors. Tim's honors thesis was entitled "3D Motion: A General System for Educational Simulation of Motion along a Path Using Macromedia Flash." Tim's thesis resulted from work he had done for the department as a Tech Fellow. Tim's future plans are still somewhat uncertain but it appears that he will enter the seminary and continue some computer consulting work. In addition to completing the requirements of the honors program, both Tim and Anna graduated summa cum laude. Dave Schimelpfenig also graduated this spring with a major in physics. While he was an undergraduate at the U, Dave participated in swimming and water polo. Dave will be an outdoor educator and is starting his career by spending a month in the Alaskan wilderness.

### **Current Students**

This year the Joseph and Margaret Nelson scholarship was awarded to Philip Maass, Zach Parsons, and Adam Tjaden. These three students are new to our program, having just completed their first year at USD, and we look forward to many good things from them. Katie Jacobs received the G.I. Moller scholarship, which is given to an outstanding senior-level student who has been active in departmental activities. In addition to being an outstanding student in both physics and music, Katie has served as president of the physics club and assisted with numerous departmental activities and events. As always, we welcome additional contributions to the G.I. Moller scholarship fund. Inquiries may be addressed to the USD Foundation or to the department. Having scholarship money available in physics allows us to attract and retain some of the best and brightest students to our program.

Our students have also been very successful in securing other scholarship money awarded by the College of Arts and Sciences. Akinwunmi Odeneyi (triple major: physics, mathematics and computer science), Andrew Van Osdol (double major: physics and history), Nikki Boomgaarden (triple major: physics, chemistry and mathematics), and Eric Omdahl (triple major: physics, mathematics and economics) each received a Glenn E. & Barbara R. Ulliyott scholarship. Our students continue to have success in receiving summer internships. Andrew Van Osdol will be spending part of the summer at NASA in their Spaceflight and Life Sciences Training Program. Zach Parsons received an internship at Brookhaven National Laboratory where he will be studying neutrinos.

This past year our students presented their research activities in a variety of venues. Nataly Jager was chosen to present at "Posters on the Hill" in Washington, D.C., which is a very prestigious venue for undergraduate research. Nataly's work, supervised by Dr. Keating, examines asymmetries in the interplanetary magnetic field and has important implications for communications systems and power grids. Nataly also presented a poster at the National Conferences on Undergraduate Research (NCUR) in Indianapolis that examined the possibility of finding metallic hydrogen in the Sun. Several students also presented their work at IdeaFest, our local celebration of research on campus. Tim Margheim presented a poster entitled "3D Motion: Modeling Arbitrary Paths"; Nataly presented her poster on metallic hydrogen and Maria Martin gave a talk entitled "First Clinical Use of Aegis Aortic Annula." Maria's paper was a result of work she did during an internship at the Mayo Clinic. The physics and astronomy club participated in a number of events this past year, including a physics fair during the Science Olympiad on March 27. The demonstrations they organized as part of this activity were a big hit with the middle school and high school students participating in the Olympiad.

## **Administrative Changes**

Although we did not lose any faculty to active duty status this year, the department was still shorthanded because we chose to fill the new position beginning in the fall of 2004 rather than this past spring. As usual everyone pitched in to cover the necessary courses. In addition to maintaining and producing our online manual for the introductory physics labs and teaching several sections of these labs, Wayne also added a section of our upper-division lab in both the fall and spring semester to his usual workload. Dr. Keating stepped in and picked up the Classical Mechanics course, and Tim Cowman of the South Dakota Geological Survey taught the digital electronics course once again. Nataly Jager taught both astronomy and physics labs for us and Chris Dabney assisted with the introductory physics lab to ease some of Wayne's workload. We continue to share some of our upper-division physics courses with both SDSU and SDSM&T. This past year USD originated the upper-division electromagnetism course and classical mechanics and received thermodynamics from SDSU and quantum mechanics from SDSM&T. I have enjoyed this past year in the Dean's Office, though I would like to spend more time in the classroom.

The conversion of the Homestake Gold Mine to a deep underground laboratory appears to be moving forward. The Governor of South Dakota created the Homestake Laboratory Conversion Project to facilitate the process. While the timeline may be somewhat longer than desired, the proposal is still moving ahead.

## **Former Students**

*Kortney Klinkel (B.S. 2003)* completed her first year in the graduate program in Chemistry at the University of Colorado, passing all six of her cumulative exams, the only organic/inorganic student to do so. She spends her free time playing softball, where she recently caught a fly ball hit by 2001 Nobel Prize Winner Eric Cornell.

*Cara Hamilton-James (B.S. 2003)* completed her first year in the medical school at the U. This summer she will be participating in a Siouland-Tanzania Educational and Medical Missionary (STEMM) trip to Tanzania. On this trip, she will be doing everything from digging holes for outhouses to assisting with orthopedic surgeries.

Once again, we enjoy hearing from all of you. Please keep the information coming. Send the information to [phys@usd.edu](mailto:phys@usd.edu) or you may send the information to me via regular mail in care of the physics program at USD. You may also wish to explore our web site at [www.usd.edu/phys](http://www.usd.edu/phys). Thank you for all of your support and I look forward to hearing from you.

Best Wishes,

Tina Keller, Director