INSIGHTS

UTAH STATE UNIVERSITY - COLLEGE OF SCIENCE

When students and faculty learn together... discovery follows.

WINTER 2008

Exploring the Building Blocks of Life

Undergraduate Research Fellow Katherine Grover pursues challenges in computational biology

Biology | Chemistry and Biochemistry | Computer Science | Geology | Mathematics and Statistics | Physics

FROM THE

DEAN'S OFFICE

Dean Mary Hubbard

What a pleasure it has been for me during the past five months to get to know so many excellent faculty and students during my initial time as the new dean for the College of Science. Last summer my family and I said good-bye to our K-State Wildcats and friends in Manhattan, Kansas and headed to Cache Valley. Hassles of change-of-address forms, new drivers' licenses, new bank accounts and doctors, have been forgotten as we enjoy this gorgeous valley, this exciting campus, and many new friends and colleagues. I am appreciative of the status of the college that **Don Fiesinger** handed to me and of the help that he has provided to me during the transition.

So what have I found here? I've found a state of great beauty that seems to be enjoying a period of growth and prosperity beyond that found in much of our nation. I've found a campus that is currently under excellent leadership and is moving in the directions that will provide the very best learning environments, superb research facilities, and increased visibility nationwide. I've found an alumni base of Aggies whose generosity is helping our leaders realize their great vision. I've found six wonderful science department heads who work hard as they provide guidance for their respective departments. I've found faculty devoted to their teaching and research missions. And I've found some of the most dedicated and bright students who are the future of our science and mathematics disciplines.

It has been a pleasure for me to meet not only faculty and students from the USU Logan campus, but also from the regional campuses and affiliated sites in the Uintah Basin, Brigham City, Tooele, and Ephraim (Snow College). There is true vision in the efforts to take higher education to students whose situations preclude them from coming to Logan as full-time students. Utah State is using technology to enhance classroom instruction in a variety of locations, not to replace traditional instruction.

As the college moves forward into 2008, we will see more collaborative research activities. Interdisciplinary approaches to problems are currently encouraged by funding agencies and often lead to discovery not possible from the approach of a single discipline. Students at all levels at Utah State will continue to find opportunities to conduct research in their interest areas. I plan to work with department heads and faculty to increase diversity among faculty and students. Employers are often looking for diverse perspectives to the problems they face and would like to see diverse applicant pools from our student body.

I am pleased to announce the formation of the College of Science's first Advisory Board. We met this fall and found more to talk about than we had time at hand. Input from off campus is valuable as we work to provide the best learning environment possible and the best research climate we can.

I look forward to meeting more of our alumni as I explore Utah and visit places around the country and perhaps beyond. We welcome your visits to campus as well. Please enjoy reading about a selection of our success stories. There are more to come!

Sincerely,

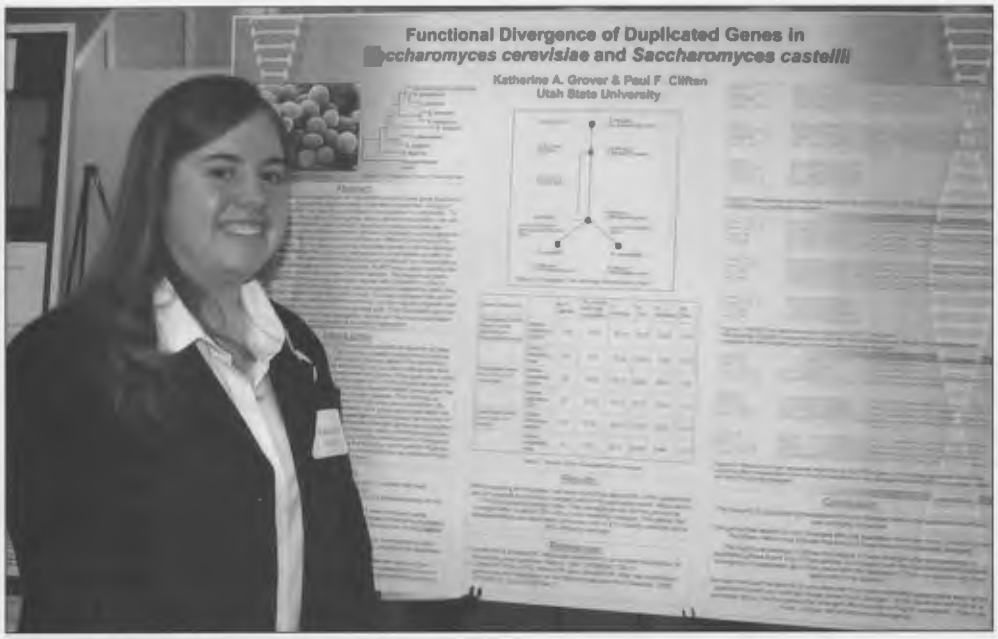
Inside Insights

On the cover: Undergraduate Research Fellow Katherine Grover pursues research challenges in computational biology. The Wellsville, Utah native and Presidential Scholarship recipient studies yeast genes with faculty mentor, Paul Cliften.

Cover photo by Donna Barry. Cover design by Megan Hemmert.

EXPLORING THE BUILDING BLOCKS OF LIFE

UNDERGRAD RESEARCHER KATHERINE GROVER PURSUES CHALLENGES IN COMPUTATIONAL BIOLOGY



Undergraduate Research Fellow Katherine Grover presents her findings at the 2007 Undergraduate Research Day on Capitol Hill in Salt Lake City.

In high school, USU Undergraduate Research Fellow **Katherine Grover** thought she might choose music as her college major.

"But I don't like to perform," says the pianist, who grew up in Wellsville, Utah.

Then came a biology class at Mountain Crest High School taught by USU alum **Larry Litizzette,** who earned bachelor's degrees in fisheries biology and secondary ed/biology in 1983 and 1984, respectively, and holds a master's in secondary ed/biology.

"His class was great and really got me interested in science," says Grover, a biology major and Presidential Scholarship recipient.

But she still wasn't sure about her college destination. Between her junior and senior years of high school, Grover attended the USU Center for Integrated BioSystems' week-long summer Biotechnology Academy.

"Once I attended the academy and saw what the university had to offer, I was really excited. I was hooked," she says.

Now in her fourth year at Utah State, Grover is a veteran peer advisor in the Biology Department and is building an impressive resume of research experience.

Her initial forays into research involved classic 'wet bench' science, but Grover found the pace slow and tedious. She subsequently teamed with faculty mentor **Paul Cliften** on a project focused on learning about the origins of new gene function after genomic duplication. In the process, she discovered her affinity for computational biology.

"Some of my peers find computational biology boring, but I like that our work moves quickly," she says. "I can pull out results in a few hours."

Grover and Cliften study yeast genes. Yeasts make good study subjects, they say, because several species are fully sequenced; some are partially sequenced, and they are fairly easy to analyze. Plus, it's cost-effective for research.

"Our research doesn't require a lot of money," she says. "It just requires a computer."

"We studied two related yeast species, *Saccharomyces cerevisae* and *Saccharomyces castellii,* whose common ancestor underwent a whole genome duplication," Grover says. "By comparing existing duplicated genes in the species, we can infer whether the functional divergence occurred before or after the speciation event."

For the project, Grover and Cliften used bioinformatics tools and wrote ad hoc Perl scripts to compare the related genes in the two species. Programming was a new skill for Grover who found the technique "daunting at first but you get the hang of it."

"Perl gets the job done and that's what we need," says Grover, who keeps a well-worn programming guide at the ready.

She presented the research in various forums beyond campus – first, to Utah legislators at the 2007 Undergraduate Research Day on Capitol Hill in Salt Lake City, then at the Utah Conference on Undergraduate Research, also in Salt Lake, and the National Conference on Undergraduate Research in San Francisco. In 2006, Grover won an award for her poster at the spring Biology Undergraduate Student Research Symposium.

"Exploring the evolution and mutation of genes is important because it shows how evolution occurs and how an organism might evolve in the future," Grover says.

For their current research, Grover and Cliften are studying yet another yeast species, *Candida tropicalis,* by comparing it to six

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ADVANCING DIVERSITY

NSF-FUNDED ADVANCE PROGRAM SEEKS TO INCREASE PARTICIPATION OF WOMEN IN SCIENCE

Hiring female faculty members in target areas at Utah State University has risen as a result of a five-year National Science Foundation ADVANCE Institutional Transformation Award.

USU is one of 32 schools nationally to receive the grant, and as the university enters the fifth and final year of the award, significant results are being noted, says USU's ADVANCE Program Coordinator **Trish Kalbas-Schmidt.**

The trend of losing faculty women to non-retirement attrition has been turned around, and the rate is now lower than that of male faculty members, she says. An impressive number of women have been promoted to full professor during the grant's operation.

The NSF formed the ADVANCE program in 2001 with the goal to increase the participation of women in the scientific and engineering workforce through increased representation and advancement of women in academic science and engineering careers. Through ADVANCE awards, NSF seeks to support new approaches to improve the climate for women in U.S. academic institutions, facilitating women's advancement to the highest ranks of academic leadership.

A central goal of the NSF-funded ADVANCE program is to increase the advancement of women in science and engineering careers in academia. Student Amrita Dubey conducts research in USU's Center for Integrated BioSystems.

The ADVANCE program at USU, which promotes gender equity and faculty effectiveness throughout the university, was launched in fall of 2003. Principal investigator for the program is **Christine Hult,** professor in the Department of English and associate dean of the College of HASS. Co-principal investigators are **Kim Sullivan,** associate professor, Biology; **Ronda Callister,** associate professor, Management and Human Resources; **Robert Schmidt,** professor, Environment and Society; and **Christine Hailey,** professor, Mechanical & Aerospace Engineering and associate dean in the College of Engineering.

"The investigators are, through hard work and a clear mission, seeing results," says Kalbas-Schmidt.

Driven by the mission of fostering a supportive workplace environment, the program's investigators have been involved in a number of areas on campus. Professional development for faculty and administrators has been provided, as well as leadership training. The program also addresses work and life family issues, assists in faculty searches and has initiated department transformations. USU ADVANCE has provided needed faculty programs, including collaborative seed grants, associate-to-full faculty grants and transitional support grants.

Highlights of ADVANCE-initiated transformative impact at USU are discussed in detail below.

COLLABORATIVE SEED GRANTS

The collaborative seed grant program is designed to boost collaborative research by female tenure and tenure-track professors in STEM (science, technology, engineering and mathematics) departments. In three years of seed grant funding, the program has invested in faculty of both genders by awarding nearly $184,000 to 26 faculty proposals from all seven colleges.

Seed grant funding supports mentoring of assistant professors by established faculty and with peers. Grants also encourage collaboration with other universities. The seed grants have supported USU faculty research in different countries and have provided training for principal investigators in nationally recognized labs. In addition, with more than half of all funded projects including student involvement, the seed grants reach beyond faculty by providing research opportunities such as field and laboratory experiences at local and regional campuses for undergraduate and graduate students.

FACULTY GRANTS

Transitional support and Associate-to-Full Faculty grants in the amount of approximately $86,000 have been awarded to 15 men and women faculty since the beginning of ADVANCE. These grants allow or provide faculty members bridging funds to support research during times of family crisis, including medical emergencies. Others have been able to target specific research goals that aid promotion to full professor, such as completing work on a scholarly book or traveling to a research site in Africa with an infant. These small amounts of money have enabled faculty to keep research on track, not only helping the individual but, at the same time, helping their departments and the university to retain and promote valued faculty members.

RECRUITMENT

USU's ADVANCE team set a recruitment goal of hiring women in the STEM departments at or above their availability in the national pool. Overall hiring for the STEM colleges was at 54 percent of availability during the five years prior to ADVANCE. In stark contrast, hiring women in the same areas has risen to 92 percent of availability since the onset of ADVANCE. The number of STEM women faculty has risen from 30 in 1996 to 50 in 2006.

RETENTION

Prompted by the relatively high rates of non-retirement attrition among women faculty, the USU ADVANCE team's retention goal was to drop rates for women to levels seen among male STEM faculty members. In the five years prior to ADVANCE, USU lost 39 percent of women STEM faculty due to non-retirement attrition. According to the October 2006 faculty survey, that trend has now been completely turned around and the non-retirement attrition rate for women has become lower than that of men. Constantly losing and replacing faculty (which, in part, requires additional start-up funds for laboratories and research programs) is very expensive; retention of both men and women faculty means the university's investment in start-up funds for new faculty is also retained.

ADVANCEMENT: PROMOTION FROM ASSOCIATE TO FULL PROFESSOR

At the start of the ADVANCE project, five women were full professors in the four STEM colleges, and only five women had been promoted from associate to full professor during the previous

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ADVANCE IN ACTION

COLLABORATIVE SEED GRANTS FOSTER INTERDISCIPLINARY RESEARCH, FUNDING OPPORTUNITIES

USU geologist **Carol Dehler** and colleague **Bonnie Pitblado,** a faculty member in USU's Department of Sociology, Social Work and Anthropology, present a successful example of how teamwork can leverage ADVANCE seed grants into significant national funding opportunities.

The duo recently landed a $180,391 National Science Foundation grant to pursue an innovative project to geochemically and microscopically fingerprint quartzite. Their endeavors were fostered through USU's ADVANCE program.

Prehistoric people used stone quartzite for millennia to manufacture spear points and other stone tools. Characterizing the quartzite used to make tools will allow archaeologists to reconstruct where prehistoric people obtained their raw stone and, by extension, how they moved across landscapes through time and space throughout the world. Geologists will benefit from the ability to characterize quartzite formations across the globe.

Dehler and Pitblado's collaboration grew from a $9,000 seed grant received through USU's ADVANCE program in 2004. They used the funding to test six methods for profiling quartzites from unique geologic sources through analysis of trace-element composition and microscopic properties. They identified two methods that worked particularly well and used their results as the basis for the just-funded proposal to NSF.

"The collaborative seed-grant initiative worked just the way

Carol Dehler

Bonnie Pitblado

we had hoped it would," says Trish Kalbas-Schmidt, USU ADVANCE program coordinator. "Dr. Pitblado and Dr. Dehler leveraged a small grant from ADVANCE into an external grant 20 times larger. In the process, two USU scientists who previously did not know each other developed a close collaborative relationship that will bear fruit for years to come."

Pitblado agrees.

ADVANCE IN ACTION...
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'PEAK PRIZE' BOOSTS STUDENT RESEARCH OPPORTUNITIES

PROFESSORS DAVID AND TERRY PEAK LONGTIME SUPPORTERS OF UNDERGRAD RESEARCH

When Undergraduate Researchers of the Year are recognized April 1, 2008 at USU's annual Student Showcase, their award will carry a new name: **The Peak Prize**. College of Science faculty member **David Peak,** professor of physics, and his wife, **Terry Peak,** associate professor of social work, recently contributed to the prize endowment.

Professors Terry and David Peak are longtime supporters of undergraduate research at USU. Photo by Jared Thayne.

"These two faculty members have invested in undergraduates significantly since their arrival at Utah State in 1994," said **Brent Miller,** USU's vice president for research.

"We could not be happier to see these two faculty colleagues recognized in this way," said Associate Vice President **Joyce Kinkead,** who oversees the undergraduate research program at Utah State. "I learned so much about undergraduate research from David Peak; his advice has influenced our program enormously."

The **David and Terry Peak Undergraduate Researcher of the Year Award** will be presented to one student from each of the seven academic colleges as well as one student from a regional campus.

"Utah State is recognized across the nation for its emphasis on student-centered, hands-on learning by faculty who care," said Miller. "Our students benefit from faculty mentors who provide advice on methods of research and analysis. Faculty mentors often provide students with their first entry into professional circles by supporting the distribution of students' work through professional conference participation or publication."

Both David and Terry have earned accolades for their work with students.

Terry, director of the Social Work Program, was named Robins Advisor of the Year in 2007 and is a multiple Top Prof winner.

"All of the students involved in the Social Work department who have interacted with Dr. Peak know she is invested in the success of each of us individually," said **Emily Lewis,** a social work major. "She works to connect with each of her students and to empower us to achieve greater academic and professional success. "

David has been honored as the College of Science Teacher of the Year as well as Undergraduate Research Mentor of the Year. He was also recognized nationally in 1996 by the American Physical Society for his work with undergraduates. He was also a founding member of the Council on Undergraduate Research and served as a councilor in the physics/astronomy division.

"My associations with Dr. Peak have been an invaluable part of my undergraduate experience," said **Jennifer Albretsen,** a physics major. "I always looked forward to attending his modern physics class. He teaches quantum mechanics and general relativity in a way that students understand and enjoy. He is an engaging and effective instructor. I don't think I've laughed harder or learned more in any other class."

David 's national reputation for championing undergraduate researchers includes being a founding board member and chair for the National Conference on Undergraduate Research. His influence also led to the creation of the NCUR Interdisciplinary Grant Program that has awarded dozens of campuses the opportunity to create interesting research projects for students from diverse disciplines.

'PEAK PRIZE'...
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LENDING ENCOURAGEMENT AND A HELPING HAND

USU ALUMS ESTABLISH SCHOLARSHIP ENDOWMENT TO SUPPORT 'BRIGHT, MOTIVATED STUDENTS'

When USU alums **Charles and Leah Hendricks** decided to establish a scholarship endowment in Utah State's Department of Physics, they chose to provide a merit-based scholarship to benefit students who perform well and reward them for their hard work and initiative.

Charles, who earned a bachelor's degree from Utah State in 1949 and currently serves on the college's Advisory Board, says his studies prepared him well for his career in experimental physics. His distinguished career spans more than five decades and has included appointments at top university, industry and government laboratory posts.

Leah earned a bachelor's degree in agriculture/household economics and management in 1960.

Charles retired from the University of Illinois, Champaign, where he established the Charged Particle Research Laboratory and held professorships in both electrical engineering and nuclear engineering. He was awarded Professor Emeritus status in 1980.

Charles subsequently joined the Lawrence Livermore Laboratory at the University of California, where he led successful research in the laser fusion and "Brilliant Pebbles" programs. After his retirement from LLL, he served as chief scientist for Schafer Corporation, where he continued his research in innovative glass shell technology for laser fusion and hydrogen storage for fuel cells.

Charles is a Fellow of the American Physical Society and a Fellow of the Institute of Electrical and Electronics Engineers.

Leah pursues numerous endeavors in the arts, with a particular interest in textiles and weaving. She and Charles live in California.

Charles and Leah say they want to do their part to support "bright, motivated physics students."

Charles offers this advice to students, "Learn about everything you can. Take advantage of opportunities beyond science and enjoy the cultural and artistic opportunities the university provides." ■

During a recent campus visit, alums Charles Hendricks, center, and Leah Hendricks, right, learn about the latest endeavors of USU's student-led Microgravity Research Team from Physics Department head Jan Sojka.

WOMEN IN MATH

GRADUATE MENTORS FOSTER CAMARADERIE, CONFIDENCE AMONG STUDENTS

In **Inga Maslova's** native country of Lithuania, half of college students studying math are women. They take their studies seriously and attend class regularly. So it was quite a culture shock when Maslova came to the United States to complete her Ph.D. in statistics at Utah State University.

"Math phobia is common in this country," says Maslova, who teaches introductory and 2000-level classes for the Department of Mathematics and Statistics as part of her graduate degree fellowship. "Students, women especially, are afraid of math."

At most, only a handful of women can be spotted in post-calculus classes in the department. "They don't think they can do it," she says. "They take a test and choke because they can't remember anything. They get discouraged because of lack of self-confidence."

USU alum and College of Science Advisory Board member Ruth Novak, second from right, joins graduate students, from left, Amanda Cangelosi, Marti Garlick and Inga Maslova during a recent campus visit.

Since spring 2006, women students in the department have enjoyed a support system that encourages them in their educational and professional goals. USU's student chapter of the Association for Women in Mathematics hosts career and teaching workshops, and research presentations by math faculty and graduate students. As many as 50 students find time during their hectic day to meet over the lunch hour. At every meeting they get to network with women with similar aspirations. Another purpose of the chapter is to promote equal opportunity and treatment.

Faculty advisor **Peg Howland** wanted a chapter at USU because of the community of women that supported her in graduate school at University of Minnesota. A women's group, formed by grad students while she was there, introduced her to every female in the department. She connected with an even larger community of women in math at national conferences, thanks to the travel grants and workshops offered by the Association for Women in Math.

USU's student chapter provides not only a support system for women in a predominantly male field but education for men.

"The meetings are well attended by everyone. Male professors and students who come really enjoy the information we give," says chapter program chair **Marti Garlick,** a non-traditional graduate student with two children who wants to advance her career in biotechnology.

During chapter meetings important research findings are explained, including those impacting performance in the classroom. According to Howland, studies have revealed gender differences in self-perceptions that may partially account for lack of confidence among women. In these studies females who received As in math tended to perceive themselves as failing to master the subject even though their grades and standing among their peers showed otherwise, whereas male students who earned Cs were more likely to assume the class was easy and that it was unnecessary to work hard.

Through research presentations and other chapter activities, Maslova and Garlick get to share their own enthusiasm for the mathematical sciences and role model it for younger, less experienced students, especially undergraduates. As newly elected chapter president and an instructor, Maslova can offer advice for anxious students. "I tell them, 'it's like learning a language only this language has very strict and clear rules.' As you learn those rules, you learn how to think more logically and to organize your thoughts."

Even more convincing perhaps is the testimony of women in the workplace who have done exceptionally well. One of the chapter's first guest speakers was USU honorary degree recipient **Ruth Novak '58 '60MS,** who serves on the College of Science's Advisory Board. After graduating with two degrees from the department, she charted an unusual course for a woman of her generation. Thirty years later, on her retirement from Hercules Aerospace Corporation in Magna, Utah, she was a vice president who oversaw the work of 5,000 employees. She had also made a name for herself in the aerospace industry for her management role during the creation of the Trident, Poseidon and Polaris ballistic missile systems and her supervisory role during the implementation of two disarmament treaties with the Soviet Union. ■

USU ALUM NOTRE DAME'S CHARLES L. HUISKING PROFESSOR OF MATHEMATICS

Mathematician **Julia Knight** '64 grew up in the shadow of Old Main Hill. Her father **Arden Francen** taught in the psychology department. There was never any question that she would attend the university on the hill.

In high school, math teacher **Harry Thomas** had an influence. "Before then math seemed so rote," she recalls. "But in his geometry class we did proofs and figured out why things are true. We didn't memorize a procedure but constructed an argument. I liked that a lot."

As one of the few women on campus majoring in math, she was often the only woman in the class but that didn't bother her. She says none of her professors tried to hold her back.

USU alum Julia Knight is the Charles L. Huisking Professor of Mathematics at the University of Notre Dame. Photo courtesy of the University of Notre Dame College of Science.

At first she envisioned herself in applied math, perhaps in the social sciences or physics. "But the more I learned, the more I realized I liked just math."

In an independent study with Professor **Joe Elich,** who also taught her calculus, she was impressed with his willingness to interact with students. "When you asked a question, he would not brush you off. He would give a serious answer."

After graduating, on the encouragement of Elich, she went to Berkeley for her PhD, where she met her husband, **William Knight.** While raising their young son, she taught at Penn State part-time, then secured a full-time, tenure-track position at Notre Dame. Today she serves as director of graduate studies in her department and holds the Charles L. Husking Professorship of Mathematics.

Knight's specialty: mathematical logic. She enjoys the mix of algebra with formal logic and has numerous publications to her credit.

During Notre Dame's 2007 spring commencement, Knight received the university's James A. Burns, C.S.C., Graduate School Award. The honor is given annually to a faculty member for distinction in graduate teaching or other exemplary contributions to graduate education.

At an age when some hard-working professionals yearn for retirement, she is thinking of anything but. "I want to keep working with students as long as I do it well," she says. ■

EXPLORING THE BUILDING BLOCKS...

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other closely related species.

The pair is trying to identify species that could be sequenced and compared, to fuel efforts to learn more about the fungus. *Candida tropicalis* is a major cause of opportunistic infections in persons with compromised immune systems.

"We're looking for non-coding RNA," Grover says. "Piece by piece we're studying how cellular processes work."

As she looks toward the conclusion of her undergraduate studies, Grover is considering graduate school and a career in research.

"I like research and I like computational biology," she says. "You can find really interesting information through this discipline that you can't find under a microscope or in a gel."

Advancing efforts in genomics research are yielding reams of data – more than the scientific community can keep up with.

"That's where computational biologists step in," Grover says. "We can process the data and foster discovery." ■

'PEAK PRIZE'...

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David and his colleagues in the Physics Department have been especially proactive in helping their students seek national and international scholarships and fellowships. Most recently, Fulbright awardee **Jan Marie Andersen,** who is currently at the Niels Bohr Institute in Denmark, credited Peak with helping develop the application. Rhodes Scholar **Lara Anderson** also received guidance from him, as did recent Goldwater honorees.

Both David and Terry currently mentor Undergraduate Research Fellows.

"I have had the opportunity to work on a research project with Dr. Peak, and I have always enjoyed the extent to which he involved me in the research," said **B.J. Myers**, a student who is working on a National Science Foundation-funded grant with Peak and Biology professor **Keith Mott.** "I was not a set of hands doing a menial task to help *his* research. *I* was a researcher, building a solution to the problem at hand with Dr. Peak's expertise and insight as my guide." ■

– Kinsey Love, USU VP for Research Office

USU ALUM SHARES LOVE OF GEOLOGY

MELISSA CONNELY NAMED KLAENHAMMER CHAIR AT WYOMING'S CASPER COLLEGE

USU alum and geology instructor **Melissa Connely** (MS '02, Geology) says Utah State exceeded her expectations.

"USU was like a second family," says Connely, who was recently named the first Klaenhammer Chair for Earth Sciences at Wyoming's Casper College. "The faculty and staff were supportive and truly cared about their students. I recommend USU to all of my students here and proudly display my diploma on my office wall."

Following graduation from USU, Connely headed to her current position where she received tenure last year and was honored with the college's Rosenthal Award for Teaching Excellence. Being named the Klaenhammer Chair, she says, was a big surprise.

"I am very proud to be the first recipient of that honor," Connely says.

In addition to teaching, Connely serves as interim director of the college's Tate Geological Museum.

"It's been a very busy and exciting year from me," she says. "I hope my story will inspire other students to hang in there and finish their degrees."

Connely's award was described in a recent article in the *Casper Star-Tribune* newspaper. Excerpts from the article, written by Barbara Nordby and reprinted with permission, follow:

A love for sharing science earned Melissa Connely, a geology instructor at Casper College, the distinction of being the first Klaenhammer Chair for Earth Sciences.

Connely was chosen this summer in part by Dr. Walter Nolte, Casper College president, and Carmen Simone, vice president for academic affairs.

"I knew nothing about it," Connely said. "It's truly an honor."

An endowment from Helen Klaenhammer and her family created the chaired position at Casper College, and also pays the chairperson's salary. The state matched the endowment dollar for dollar through the Wyoming Community College Endowment Challenge Matching Program.

While earning her associate's degree in education at Casper College, Connely volunteered at the Tate Museum and took several geology courses. Eventually, she changed her major to science and earned bachelor's and master's degrees in geology.

When a teaching position came open at Casper College, Connely applied and became an adjunct instructor. She's now been a full-time faculty member for the past six year.

USU alum Melissa Connely guides her students in the use of GPS units during a class at Casper College.
Photo by Kerry Huller, courtesy of the *Casper Star-Tribune.*

But as Connely first started her career, geology wasn't a glitzy field.

"At the time, geologists were kind of like refrigerator repair people," Connely said. "The importance of resources like oil and petroleum has led to an increased interest in geology and other earth science fields."

Teaching students pursuing the field has also been a treat for Connely. She is the sponsor of the Geology Club and teaches 10 different classes on campus.

"They are so cool," she said of her students. "It's neat to see their enthusiasm."

The Klaenhammer endowment gave preference to female instructors. But gender wasn't the only factor in the decision, Simone said.

"Melissa wasn't chosen because she's a woman, but because she's a great faculty member," Simone said,

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INSIDE THE MIND OF A PHYSICS STUDENT

UNDERGRAD PHYSICIST SEES INTRICATE NATURE OF UNIVERSE IN EVERYDAY LIFE

It's called a light cone.

At the instant an event occurs — a baby's first smile, your calf cramping from dehydration, or your shin striking the coffee table as you rush to answer the door — the information from that event only exists where it occurred. A second later, that information has spread in a radius of one light-second. A year later, one light-year. Every second, the information covers a wider area than it did the second before. Expanding area circles over time — a cone. Now apply light cones to creation, the Big Bang.

Billions of years ago, or 6,000 years ago depending on whom you ask, a violent event of unimaginable proportions created an expanding universe of energy and matter. Eventually that matter collected into the roughly spherical mass we've deemed Earth. But the information from the Big Bang event isn't lost to time. Time, in fact, is exactly where it is stored.

The light coming from a lamp ten feet from your bed reaches you almost instantly. The light from the sun is eight minutes old when it hits your grandfather's balding head, possibly giving him skin cancer.

The farther away the light source, the older its light when it reaches our eyes, possibly making our imaginations run rampant. With a big enough telescope, we can peer as far back into the Big Bang's light cone as we wish — even to the event itself.

Welcome to the world of physics junkies, or more appropriately, physics majors at Utah State University. They don't see the world you see, they see the world as you could see it. The water is warm, jump on in.

Sydney Chamberlin knows this world. Chamberlin, a 21-year-old from South Jordan, Utah, is well into her fourth year at Utah State, meaning she has a year left in Logan.

"A four-year degree is a myth," says Chamberlin.

The university won't mind another year of her charisma. Chamberlin has excelled in her studies and was elected secretary of USU's Society of Physics Students. After she gets her bachelor's, she plans on studying the theoretical side of her passion, mathematical physics, at an out-of-state graduate school.

Those plans can be intimidating, even in an academic setting. Nobody knows how many conversations have lost momentum after one person revealed their major in physics, but a safe bet is lots.

Asked if she's experienced the stereotype that comes with physics, Chamberlin laughs. "Oh definitely, definitely."

The stereotype surrounding these intellectuals is well known, its

CIVIL AIR PATROL HONORS USU PHYSICS STUDENT

When physics student **Sydney Chamberlin** received the Civil Air Patrol's prestigious Spaatz award this past summer, the honor carried special significance. Sydney and her dad, David Chamberlin, became the first father/daughter duo in the country ever to have both received the award.

Sydney accepted the award July 20 at Utah's Hill Air Force Base from Brig. Gen. Kathleen Close. Her dad received the award as a cadet back in 1979.

Service with the Civil Air Patrol is a longstanding tradition with the Chamberlin family. Sydney's father currently serves as squadron commander. Her mother, Sue Chamberlin, is the wing public affairs officer.

Established in 1964, the award honors the memory of the Air Force's first chief of staff, Gen. Carl "Tooey" Spaatz. The patrol's highest honor, the award is bestowed upon cadets who demonstrate excellence in leadership, character, fitness and aerospace education. ■

Civil Air Patrol cadet and USU student Sydney Chamberlin, right, accepts the Spaatz award from Brig. Gen. Kathleen Close at Utah's Hill Air Force Base.

documentation unnecessary, but how correct is the stigma of social incapability? A recent physics department social sheds some light.

Recently, more than 100 physics junkies — students and staff, faculty and friends — gathered for an evening of food, friends and volleyball.

One group fashioned an impulse balance beam out of a tie-down strap secured to two trees, an activity known as "slacklining." Balancing on a single strip of cloth isn't as easy as balancing on a steady stripe of wood, which most people couldn't do anyways. Quite to the contrary, the cloth reacts to your actions more violently than an angry girlfriend. Action and reaction. Newton's third law. Physics. Let the good times roll.

Physicists' games may seem nerdy, but applying what they learn in class to recreational pursuits just comes naturally to them.

"If you spend so much of your time thinking about one thing, then you start to relate it to everything. I think that can be said of anything," says Chamberlin, who works about 15 hours per week in a campus computer lab.

Another example of this gray line between school and play is biking, a favorite hobby of hers. Chamberlin likes to bike every other day for close to two hours at a time. Her equipment includes a $2,000 mountain bike. Chamberlin tried to organize a group ride up Smithfield Canyon in September, but rain put those plans on hold.

"The coefficient of friction on a wet road is way lower than the coefficient on a dry one," says Chamberlin, who grades papers for USU's modern physics course.

Three riders showed up with their equipment that Saturday morning, and at least seven other riders were expected before Mother Nature decided not to cooperate.

"We talked in the parking lot for like an hour and then we left."

Certainly there are many explanations as to what causes the stereotype that Chamberlin seems to not fit. One explanation hinges on the heavy math load in studying physics, but Chamberlin doesn't think this is a valid argument.

"I think a lot of people underestimate themselves when it comes to math." She adds, "Math is just different: You have to learn how to study it."

The heavy math load leads to a second possible explanation for the socially challenged stereotype: physicists' apparent absence from the social world itself.

"The weekends are just for homework and weeknights are just for homework," says Chamberlin, adding, "All of my friends and everybody in the department, we just do homework all the time."

And how can physics majors escape the stereotype?

"Well, everyone else can get smarter. That would help." She's being sarcastic. She has a complex and advanced sense of humor.

"I think if we just had more time to socialize we would, and the reason that we sit around doing physics all the time isn't necessarily because we want to do homework with our whole lives. You just have to do it or else you get bad grades." If physics majors could pry themselves away from their bulky texts and be seen in public situations, "nobody would even know what our major was."

You also might not know their interests unless you actually talk with them. Chamberlin, for one, is interested in traveling. In addition to visits to New Orleans, Washington D.C., Florida, Alabama, Mississippi, Texas, Arizona, Washington state, Oregon, Idaho, Montana, Las Vegas, California and Colorado, she spent two summers in Europe. During an internship in Germany, Chamberlin visited Amsterdam and Paris. She also toured Australia and saw the Southern Cross with her family.

The main theme you will notice when speaking to physics majors is their passion for their studies. Even if they'd rather spend less time working for each A, they love the subject matter.

The deflection of light around stars, the way light bends, those phenomena are predicted by general relativity and can be verified by experiment, but they are described by math that didn't come about because of relativity. "The math was already there. And the fact that both ideas tie together and describe each other: That's amazing!" says Chamberlin.

They're called light cones and they extend backwards in time from events that haven't even occurred yet. Even though we can't see what lies ahead for Sydney Chamberlin, rest assured her future will be bright. ■

– C. Jake Williams
undergraduate journalism major

LOVE OF GEOLOGY...
Continued from page 12

citing Connely's love for her students and her involvement in campus activities.

Connely's fieldwork also played a part in the decision. She recently returned from an archaeological dig in Mongolia, and has also helped create a GPS and mapping course for students.

"Geology is such an important program, especially in Wyoming," Simone said. "Geology is not a dead science." ■

IBERIAN PILGRIMAGE: THE WAY OF DAVID FARRELLY

USU CHEMIST AWARDED VISITING PROFESSORSHIP FROM SPANISH MINISTRY OF SCIENCE AND ED

When **Professor David Farrelly** sets off next summer from northeastern Spain on the Way of St. James, he'll join thousands of pilgrims who walk from distant origins each year to Galicia's Santiago de Compostela. Known in Spanish as *El Camino de Santiago,* the pilgrimage shares the popular vernacular name for the Milky Way which, according to medieval legend, was formed from dust raised by pilgrims' feet.

As an enthusiastic inquirer of the physical universe, it seems fitting that the Utah State University professor participates in the centuries-old tradition.

Farrelly departed USU for Spain in September to spend a sabbatical year as a guest of the Spanish Ministry of Science and Education. The ministry awarded him a visiting professorship to conduct research at Universidad Autónoma de Madrid. His research is also supported by the United States' National Science Foundation.

"The Spanish government is investing heavily in science and encouraging international collaborations," says Farrelly, who joined USU's Department of Chemistry and Biochemistry in 1991.

During his stay in Spain, Farrelly will rekindle collaborations he established with Spanish colleagues during his postdoc years in Colorado. In addition to his work in Madrid, he'll pursue research with associates at the University of La Rioja in Logroño and the University of Santiago de Compostela.

"We're studying quantum theory of how molecules come together, how bonds break and how they form new bonds," says Farrelly, whose research focuses on chemical dynamics.

Of particular interest to he and colleagues is how chemical reactions on surfaces can be manipulated. "How can you alter a chemical reaction?" he asks. "For example, can you tune conditions so that a molecule reacts in a particular, desired way?"

Another project Farrelly plans to pursue during his sabbatical is computational research on superfluid nano-droplets of liquid helium. Using high vacuum equipment, researchers insert water molecules, one at a time, into helium droplets. This cools the molecules to absolute zero, enabling a process by which small water clusters grow and can be directly observed.

"Water is a remarkable material with odd properties," he says. "It really should be a gas at room temperature. The reason water has such weird properties is because of its hydrogen bonds."

Because hydrogen bonds are vital to so many biological processes, investigation of droplet formation at the microscopic level has many implications, Farrelly says.

Chemistry professor David Farrelly was awarded a visiting professorship from the Spanish Ministry of Science and Education for the 2007-08 academic year.

Yet another project Farrelly plans to pursue during his Iberian sojourn involves his longtime interest in astonomy. He and associates will study the dynamics of recently discovered binary objects in the Kuiper belt – a region that exists at the far reaches of our solar system. The region encodes valuable information, he says, about the primordial solar system.

"We're investigating how these celestial bodies lose energy as they form pairs," Farrelly says. "As they come in contact with each other and larger bodies they're caught in a tug of war. They're attracted to each other gravitationally, while being torn apart by solar gravity. They either collide, get trapped or escape."

What fascinates Farrelly is the mechanism, involving chaos theory, by which asteroids, moons and other minor planets lose and gain energy. Back in 2003, he, USU doctoral student **Sergey Astakhov** and collaborators at Britain's Bristol University published findings in *Nature* of their studies of Jupiter and Saturn's capture of multiple, irregular moons.

"We tend to think of chaos as not being constructive, yet these objects show that order can emerge not just from chaos but because of chaos," he says. "It's the same at the molecular level. How do atoms gain and lose energy? How do they come together and break apart?" ■

INAUGURAL PROFESSORS

COLLEGE OF SCIENCE FACULTY MEMBERS PARTICIPATE IN HONORARY LECTURE SERIES

Each year, Utah State University invites faculty members, who have been promoted to full professor during the previous academic year, to participate in the Inaugural Professor Lecture series. Each participant presents a lecture about his or her academic and professional journey at university president **Stan Albrecht's** home during a reception attended by family, friends and colleagues. We congratulate the 2007-08 honorees – **Piotr Kokoszka,** Mathematics and Statistics and **Tsung-Cheng "T.C." Shen,** Physics – who contribute immeasurably to our college.

Modeling Patience and Precision

Statistics professor **Piotr Kokoszka** recalls long work days while earning his doctorate at Boston University with faculty mentor Murad Taqqu. Just two months into the program, which he started in September 1990, Kokoszka finished his first published paper. As the Christmas break approached, he suggested a few days of rest.

Professor Taqqu replied, 'When we are dead, we can rest forever, not just for a few days.'

"Professor Taqqu was demanding, but I benefited from his attention to precision, clarity and dedication to hard work," says Kokoszka, who joined USU's Department of Mathematics and Statistics faculty in 2000.

Professor Piotr Kokoszka, center, is joined by, from left, USU First Lady Joyce Albrecht, wife Gudrun Kokoszka, Dean Mary Hubbard and President Stan Albrecht for his inaugural professor lecture.

Not that the native of Poland coasted into Boston University's program. During his teens, Kokoszka was accepted into a rigorous math-intensive program in secondary school, where he received instruction from university professors.

"We had seven hours of mathematics a week, so after four years I pretty much had the same preparation as a math major graduating after four years of undergraduate study in the U.S.," he says.

Kokoszka continued his studies at Wroclaw Polytechnic University. His official course of study was applied mathematics, though he mostly pursued abstract mathematics with a special focus on probability theory.

"I wanted to study physics or astrophysics but I was advised that Poland had no money for expensive equipment," he says. "I was told mathematics research could be done for free and Polish mathematicians were among the best in the world."

As Kokoszka was completing his master's degree at Wroclaw Polytechnic, his advisor asked him to review the first three chapters of a book draft by Taqqu, the renowned researcher who would become his doctoral advisor. Within a few weeks of sending his comments to Taqqu, the latter replied to Kokoszka with a letter urging him to apply to Boston University's doctoral program.

After graduation, Kokoszka accepted a postdoctoral position at the University of Utah, where he met his future wife, **Gudrun Schellhas.** A native of Germany, Schellhas was a graduate student in economics. The pair married in 1995 and, the following year, accepted positions at England's University of Liverpool.

"The University of Liverpool offered excellent opportunities for professional growth, but we missed the sunny skies and open spaces of Utah," Kokoszka says.

In July 2000, Kokoszka joined USU, where his wife serves as middleware administrator in the university's Information Technology Department.

Kokoszka's research interests range from space physics, financial econometrics and computer network traffic to heavy-tailed time series, long-range dependent and self-similar time series. He was named College of Science Faculty Researcher of the Year in 2007.

"I've had the opportunity to work with many excellent collaborators in both Europe and the United States which, in part, explains my many interests," he says.

Kokoszka says heavy-tailed distribution theory is useful in describing phenomena in which some observations are much larger than usual – for example, Internet traffic. Another focus of his studies is long-range dependent processes.

"These models are particularly useful for study of time series exhibiting long periods of growth or decline – such as climatic data," he says.

Kokoszka says Cache Valley reminds him of his childhood in Poland, where he spent most of his summers with his grandparents in the small town of Mlawa.

"Mlawa is in a post-glacial valley in the northeastern part of the country," he says. "It has houses all over the place with cows and horses grazing in between. I loved to ride my bike and go on long hikes in the hills and forests surrounding Mlawa; I can do the same in Cache Valley."

In 2002, the Kokoszkas welcomed a daughter, Vanessa, into their family.

"After living in different countries, it is somewhat strange for Gudrun and me that Logan is the only home our daughter has ever known," Kokoszka says. "But she has made Logan a true home for us, too."

Basic Research Fosters Technological Advancement

Physicist **T.C. Shen** notes that Isaac Newton wasn't thinking about diesel locomotives, Apollo moon missions or space shuttles when the 17th century-born scientist described gravity and the laws of motion. Nor was Albert Einstein considering CD players, bar code scanners and laser surgery when he wrote about stimulated emissions – a theory that preceded the development of laser technology.

"Science and technology are intricately linked but they're not equivalent," says Shen, who joined USU's Physics Department faculty in 1998.

"If you look at the top 20 engineering achievements of the 20th century, except for lasers, nuclear energy technology, solid state devices and high performance materials, all are based on 19th century physics

Technology can't always be planned, he says, and often grows out of basic research – though not always right away. While new technologies are needed to address a variety of challenges, including energy sources, carbon sequestration, biotechnology and more, a rush to commercialization may not yield ready answers.

"Just because research results don't show an immediate benefit or application, that doesn't mean the knowledge gained isn't valuable," Shen says.

He notes scientific progress and the resultant technological progress require not only investment in infrastructure, including labs and equipment, but a climate that fosters sharing of ideas among scientists and engineers from a variety of disciplines.

"I hope we can recognize the importance of creating such environments on campus," Shen says. "This will enable opportunities to continue to explore basic sciences and eventually convert basic sciences into innovative technologies."

In the 20th century, physicists made great strides in understanding the basic building blocks of the universe and its interactions, Shen says. "In the next century, our challenge is to understand more complicated systems, such as biological systems."

Professor T.C. Shen, second from right, is joined by, from left, USU First Lady Joyce Albrecht, wife Fen-Ann Shen, son Konlin Shen and President Stan Albrecht for his inaugural professor lecture.

Increased pursuit of nanoscience, he says, is critical to the development of future technologies. He foresees the need for technology to control wave functions of electrons and photons and grow materials with novel mechanical, electrical and optical properties for future applications in information technology.

"Physics, in particular, is affecting nanotechnology," says Shen, who heads USU's Nanoelectronics Laboratory. His current research involves surface physics, low-temperature carrier transport and nanofabrication of electronic devices.

The lab uses scanning tunneling microscopy or "STM." Employing principles of quantum mechanics, STM is a non-optical technique that uses an electrical probe to scan a surface and detect weak electric currents flowing between the tip and the surface. Invented in 1981, STM enables physicists to capture images of individual atoms.

"It's cutting-edge research," Shen says. "My dream is for USU to create an interdisciplinary facility that focuses on nanoscale characterization and fabrication."

He credits the post-World War II build-up of U.S. educational programs in science and mathematics from middle school to post-graduate levels and investment in research facilities for the technological prowess the country enjoys today.

"But we can't take the current advantage we've accumulated over the past 60 years for granted," Shen says. "If we don't invest in education, equipment and labs, we'll fall behind emerging global competitors such as China and India."

INAUGURAL PROFESSORS
Continues on page 28

NURSING PROGRAM GIFT OFFERS HANDS-ON LEARNING OPPORTUNITIES

BAMBERGER FOUNDATION PROVIDES HUMAN SIMULATOR FOR CLINICAL TEACHING

"I can't breathe and my chest hurts," gasps the hospital patient as he begins to cough.

A nurse steps into action to alleviate his distress and immediately contacts the physician.

With hospital personnel swiftly and calmly following an orchestrated set of procedures, the patient's breathing steadies as his chest rhythmically rises and falls.

Another crisis averted but, in this case, the patient isn't real.

"He breathes, he talks, he coughs, his heart beats and his body simulates a variety of physical conditions," says **Jon Kelly,** USU's campus coordinator for the Weber State University/Utah State University Cooperative Nursing Program.

Nursing student Elise Reeder, left, practices starting an IV with the SimMan patient simulator with instruction from assistant professor Jody Reese, center.

Students in the program are experiencing hands-on learning opportunities in a challenging yet safe environment thanks to a gift from Utah's **Ruth Eleanor Bamberger and John Ernest Bamberger Memorial Foundation.** The philanthropic organization recently gifted the health professions program with a patient simulator called "SimMan" – short for "simulated man" – manufactured by Laerdal Medical.

USU alum **Gordon Christensen, DDS, '56,** provided additional funding to prepare the teaching space for the simulator and provide a realistic clinical setting.

Simulators have been used in training, especially flight simulation training, since World War I, Kelly says.

"Simulation has provided great training success in high-risk situations," he says. "It's finally reaching health care where it's having a huge impact on how we train medical professionals."

Though USU's simulator somewhat resembles a CPR dummy with its vacant, open-mouthed stare, its capabilities are much more complex.

"We can program SimMan with a variety of case scenarios and instantly expose students to training situations that they might never get in conventional clinical training," says **Jody Reese,** assistant professor. "This gives students a chance to thoroughly evaluate patients, develop critical thinking skills and practice procedures repeatedly – all without the risk of hurting a patient."

SimMan is equipped to allow students to practice taking vital signs, giving injections and starting IVs, monitoring blood pressure, managing a patient's airway, providing nursing care for patients with chest tubes and more. As students conduct these procedures, SimMan reacts to their interventions.

"In preparation for real clinical settings, students need opportunities to practice their skills and build confidence," Reese says. "The simulator provides immediate feedback and a chance for students to correct errors. A mistake on a simulator reveals a problem but it doesn't result in tragedy."

Second year nursing student **Elise Reeder** says the simulator is a great learning tool. "When I first starting working in an actual medical setting I was afraid I was going to hurt my patients," she says. "I think being able to practice on a simulator makes sense. I feel better going into a real situation and knowing exactly what to do."

The field of nursing has come a long way in the past century, Reese says. Simulation, he adds, has only been used in nursing training for about the past 10 years.

"Nursing used to be a very task-oriented profession but today's nurses are truly patient advocates and take a more integrated, interdisciplinary approach to patient care," he says. "The ultimate

NURSING PROGRAM...
Continues on page 25

SMALL STUDY SUBJECT REVEALS BIG PICTURE

BIOLOGIST MIKE PFRENDER RECEIVES NIH GRANT FOR STUDY OF TINY AQUATIC CREATURES

USU biologist **Mike Pfrender** received a $1,341,453 award from the National Institutes of Health to fuel ongoing study of water fleas. The tiny aquatic creatures are known to the scientific community as *Daphnia.*

"*Daphnia* is a compelling study organism because we have a wealth of data spanning more than a century of intensive ecological investigation," says Pfrender, who co-founded the international Daphnia Genome Consortium. "These data illustrate how the organism has adapted to environmental changes."

In collaboration with the U.S. Department of Energy Joint Genome Institute, the consortium will soon supply public access to the recently sequenced *Daphnia pulex* genome.

"This NIH grant complements the *Daphnia* genome project by funding our continued development of a genomic tool kit," says Pfrender, who joined USU's Biology Department faculty in 2001. "We can now examine how individual genes function, and how the entire genome responds to ecological challenges."

The water flea is a compelling study organism, says USU biologist Mike Pfrender, because a wealth of ecological data exists about the tiny creature.

Pfrender is leading an international research group including scientists from Switzerland's University of Basel, Indiana University Bloomington and the University of New Hampshire, to tackle the four-year project.

Daphnia provides a valuable research model, he says, because it is related to a variety of well-studied organisms, including insects, and is widely used as a bioindicator in environmental monitoring and ecotoxicology research.

Pfrender, photographed at a high elevation research field site in California's Sierra Nevada, received a $1.3M grant from the National Institutes of Health. Photos courtesy of Mike Pfrender.

"It is an ideal organism to utilize to study the impact of global climate change on freshwater ecosystems," he says. "Its natural freshwater environments are readily mimicked in the lab, which allows large-scale genomic experiments of environmental stressors."

Pfrender says *Daphnia* is a unique model for understanding how the environment shapes genes and genomes. "With the development of these resources we are now in a position to explore fundamental biological questions: 'How does *Daphnia* resist threats such as parasites?' 'How does *Daphnia* develop immunity responses?'"

The research is directly relevant to human health, he says.

"With continued study, we can ask such questions as 'How do stressors in the environment influence new mutations?' and 'What are the genetic mechanisms underlying aging in *Daphnia?*'"

The grant is administered through the NIH's National Institute of General Medical Sciences. ■

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ANSWERS FROM THE INTERNET

USU COMPUTER SCIENTIST CREATES A UNIQUE, INTELLIGENT TECHNOLOGY TO GATHER INFORMATION, SOLVE PROBLEMS

USU researcher **Supratik Mukhopadhyay** and colleague Krishna Shenai of the University of Toledo are developing a unique, intelligent mashup technology that takes advantage of the popularity of the Internet.

The technology could be used in various problem-solving situations ranging from Internet-based appliance control to medicine, to a residential irrigation system, says Mukhopadhyay, assistant professor in USU's Computer Science Department.

"The global economy is driven by knowledge — knowledge is created every second in every corner of the world," Shenai says. "The Internet is free and it is a good transfer of knowledge."

Today's society relies heavily on technology, especially the Internet, to keep up with day-to-day life and to gain access to information anywhere in the world. Data on the Internet comes from millions of sources, and Mukhopadhyay has created an information management system with the ability to collect the data from disparate sources and bring it to one location for intelligent analysis.

"Our technology allows us to automatically mash together disparate information so that we can use the information to gain intelligent answers," he says.

Computer scientist Supratik Mukhopadhyay is researching ways to harness the Internet's information-sharing capabilities. Photo by Donna Barry.

The system is based on a logical behavioral model that looks at the behavior of a system or situation before it comes up with an outcome. For instance, if a cardiac care patient's condition becomes critical, the system will automatically consult a doctor to obtain an appropriate dosage of Warfarin and then prompt a nurse to administer the dosage. The technology could be used in the home, as well, to control air and water systems.

One reliable source of information supplied to the Internet comes from sensors, Mukhopadhyay says. Wired sensors are capable of collecting, reading and then logging data. For example, golf courses often use sensors to control irrigation systems. Sensors are placed at various locations throughout the golf course to monitor water saturation. The sprinklers are then turned on or off depending on water needs. Such sensors cost about $3,000 each, and the wires are vulnerable to damage.

Mukhopadhyay wants to improve sensor technology and is working to create a plug-and-play, cost-efficient smart wireless sensor networking system. What is unique about his proposed networking technology, he says, is that it will be able to work on any platform. Most technology products come with one technology standard, meaning that the product will only work with one type of system. The USU sensor can synchronize with any previously installed sensor system, cutting costs for a client.

Mukhopadhyay is also collaborating with researchers from the Naval Research Laboratory, SUNY Buffalo, and University of Tennessee to bring these efforts to fruition.

The funding for the innovative sensor research and the creation of the open source software is part of the Innovation Fund provided by the Office of the Provost at Utah State University. ■

– Maren Cartwright

NO PEACE AFTER QUAKE

GEOPHYSICIST TONY LOWRY SAYS FAULT MOVEMENT CONTINUES SINCE MASSIVE TSUNAMI

USU geophysicist Tony Lowry, pictured at a GPS receiver site, is part of an NSF-funded research team investigating fault movement following the massive 2004 Asian tsumani-generating earthquake. Photo by Donna Barry.

The day after Christmas 2004 is indelibly etched into the memory of people around the world. Surreal images of sunny Asian beaches suddenly shattered by huge walls of water burst onto television screens as viewers watched one of the globe's deadliest natural disasters unfold.

The Great Sumatra-Andaman Earthquake, which triggered massive tsunamis known in catastrophe-struck areas as the Asian Tsunami and the Boxing Day Tsunami, claimed the lives of more than 230,000 people. Ocean waves inundated coastal communities from East Africa to Southeast Asia.

The huge quake occurred when a portion of the Indo-Australian Plate slipped under the Eurasian Plate southeast of Indonesia. A 750 mile-long underwater rupture in the Earth's crust ensued, which raced northward at more than 6,000 miles per hour.

Since the quake, Utah State University geophysicist **Tony Lowry** and colleagues from the University of Memphis' Center for Earthquake Research and Information, the University of Colorado and India's Society for Andaman and Nicobar Ecology have studied the restless seismic movements of the Indian Ocean's Andaman Islands, a focal point of the disaster. Their findings are reported in the article, *"Postseismic Deformation of the Andaman Islands following the 26 December, 2004 Great Sumatra-Andaman Earthquake"* in the October 13, 2007, issue of *Geophysical Research Letters.*

"Parts of the Andaman Islands subsided or rose by up to a yard during the earthquake," says Lowry, assistant professor in USU's Geology Department. "Since then, we've used GPS technology to measure how the ground has continued to move."

Scientists have observed dramatic post-earthquake movement following several large temblors, including the 2004 quake, though the latter boasts the largest movement recorded since GPS technology became available. Lowry and colleagues collected GPS measurements of postseismic deformation at 11 sites in the Andaman Islands starting three weeks after the quake. These sites recorded from six inches to more than a foot of continued uplift and even larger horizontal motion to the southwest.

A topic of hot debate is what causes the movement.

"Post-quake movement has generally been modeled as either deep rock flow in response to the stress change during an earthquake or as continued slip on the fault," says Lowry. "Our research indicates that the Andaman post-earthquake movements resulted mostly from continuing silent slip on the fault, below the depth that slipped during the 2004 earthquake."

Study findings have further implications for the earthquake cycle on faults, including how stress accumulates in the time between quakes, he says.

"The data we're collecting may eventually help us to better understand how and how often these sorts of really big earthquakes happen," Lowry says. ■

A coastal community in Sri Lanka is pounded by a tsunami generated by the 2004 Great Sumatra-Andaman Earthquake. Satellite image courtesy of DigitalGlobe.

USU FULBRIGHT STUDENT TREATED TO THANKSGIVING DANISH-STYLE

PHYSICIST JAN MARIE ANDERSEN STUDYING AT DENMARK'S NIELS BOHR INSTITUTE

While most Aggies probably spent Nov. 22 parked in front of a televised football game balancing a plate of pumpkin pie on a full belly, Fulbright student **Jan Marie Andersen** was making her first visit to an American embassy overseas and figuring out what to do with multiple utensils in a dazzling place setting.

Andersen, who graduated from Utah State University with a bachelor's degree in physics and mathematics this past spring, won a 2007-08 Fulbright U.S. Student Scholarship to study in Denmark. The California native is investigating stellar evolution and the early universe at the University of Copenhagen's renowned Niels Bohr Institute.

Andersen, along with other American scholars and Fulbright honorees studying in Denmark, was invited to a Thanksgiving feast at the U.S. Embassy as the guest of U.S. Ambassador James Cain. Other guests included representatives of the Danish host institutions and the staff and members of the Board of Directors of the Danish-American Fulbright Commission.

"I'd never been in an American embassy before and I didn't know what to expect," Andersen says. "I imagined something like the one in the movie 'The Saint.'"

In the 1997 thriller, an American scientist played by Elisabeth Shue falls for an international thief (Val Kilmer) and the two try to outwit the Russian mafia.

"Actually, with all the security, visiting the embassy was like something out of a movie," Andersen says. "There were big iron gates, x-ray screening, armed Marines standing guard and no guests were ever left alone. I was escorted everywhere – even to the restroom."

Andersen, accompanied by another Aggie physicist, – USU grad **Randy Dunning** who is also studying at the Bohr Institute under a grant from Denmark's Ib Henriksen Foundation – met with the ambassador and other Danish dignitaries.

The meal's first course consisted of sea bass with crawfish stew which, Andersen admits, "was delicious but I've never had it at Thanksgiving before."

"It was funny because the Danes at our table kept asking if this was a traditional Thanksgiving meal," Andersen says. "We explained that most families enjoy turkey and mashed potatoes – as we did during the main course – but in a more informal way – and usually follow the meal by watching American football."

Between multiple courses, Andersen and two other Americans at the table explained that modern-day Thanksgiving is a time when people join family and friends and think about everything they're grateful for and, of course, eat a lot.

USU alum Jan Marie Andersen is studying stellar evolution and the early universe at Denmark's Niels Bohr Institute.

She says one Danish guest expressed surprise when the waiters brought out multiple dessert choices – rather than one treat – following dinner.

"'Is this how Americans eat dessert?' he asked," Andersen recalls. "He probably thought he had been missing out his whole life by previously getting only one dessert on his plate. I had to make sure he knew that it was just as big of a surprise to me."

At the Bohr Institute, Andersen and faculty mentor Jens Viggo Clausen are studying a number of older stars.

"These extremely metal-poor halo giants have large concentrations of certain heavy elements that, according to our current theories of star formation and evolution, shouldn't be there," she says. "So, the theory is that, rather than just one star, these are actually binary systems of two stars orbiting each other."

The heavy elements found in the older stars, Andersen says, could be coming from the partner stars.

"We're studying the spectral emissions from these stars and we can detect if they are binary stars because of the 'wobble' we see in their orbit," she says.

The method used to observe the stars' orbit, called the Radial Velocity Technique, is also used to find extra-solar planets. Andersen says the movement of stars causes the spectrum to be "Doppler-shifted," which she explains is similar to the way a train whistle or a police siren seems to change in frequency and pitch as it moves closer or farther away.

"Denmark is great, albeit cold and rather dark now that it's winter," Andersen says. "I'm really grateful for this opportunity to study with scientists of this caliber in a different country." ■

FACULTY HONORS AND ACHIEVEMENTS

Biochemist Steven Aust

USU biochemistry professor **Steven D. Aust** received Washington State University's Distinguished Graduate Award in Science, Education and Technology at a April 2007 ceremony.

Aust, who joined USU in 1987 as the director of the Center of Excellence in Biotechnology and has served on the faculty of USU's Chemistry/Biochemistry Department for 20 years, graduated with a bachelor's degree in agriculture from Washington State in 1960 and earned a master's degree from WSU two years later.

Aust is an internationally recognized expert on the metabolism of iron and the biological degradation of environmental pollutants by white rot fungi. His various research endeavors have been funded by the National Institutes of Health, the National Science Foundation, the U.S. Department of Agriculture, the Environmental Protection Agency, the U.S. Army, the U.S. Navy and numerous private corporations. Aust holds six patents and has published more than 300 articles in peer-reviewed journals, 20 invited review articles, 60 conference proceedings articles, contributed to 10 handbooks and has been cited in more than 4,000 papers, giving him an H-index of 56 – a measurement of the worldwide impact of his research.

Aust's list of honors is long and distinguished. He received the Kenneth A. Spencer Award from the American Chemical Society in 2005. In 2002, he was awarded the Governor's Medal for Science and Technology, the state of Utah's highest honor for scientific achievement, from then Gov. Mike Leavitt. Other honors include an Alumni Achievement Award from WSU in 1997, fellowships in The Oxygen Society in 1994 and the Academy of Toxicology Sciences in 1992 and the DuPont Science and Engineering award in 1988.

At USU, Aust received the 2003 D. Wynne Thorne Researcher of the Year award, the university's highest research honor, and, that same year, was named the University Outstanding Graduate Mentor. He has mentored 18 master's students, 34 doctoral students and 16 postdoctoral researchers.

Biologist Butch Brodie

USU professor **Edmund "Butch" Brodie, Jr.** received the 2007 Henry S. Fitch Award for Excellence in Herpetology at the American Society of Ichthyologists and Herpetologists meetings held July 11-16 in St. Louis.

"I was really surprised and pleased by the honor," says Brodie, who joined USU's Biology Department in 1994 and is the department's director of graduate studies. He served as department head from 1994-2003.

Brodie is internationally renowned for his research in the evolutionary response of various amphibians and reptiles to predators. Frequently collaborating with his son, Edmund Brodie III of the University of Virginia, the elder Brodie has published more than 150 peer-reviewed articles in scientific journals. His work has been featured in worldwide media, including *Nature, Science,* PBS's *Nova* series and program produced by the BBC and Canada's Discovery Channel.

Brodie has mentored numerous undergraduate and graduate student researchers and was named the College of Science's Graduate Mentor of the Year in 2006. In 2001, he received the D. Wynne Thorne Research Award, USU's highest research honor.

Biochemist Scott Ensign

USU researcher **Scott Ensign** has been named a member of the Prokaryotic Cell and Molecular Biology Study Section of the National Institutes of Health's Center for Scientific Review.

During his term of service, which extends to June 2011, Ensign will review grant applications submitted to the NIH, make recommendations on these applications to the appropriate NIH advisory council and survey the status of applicants' research efforts in their fields of science.

A professor in the Department of Chemistry and Biochemistry, Ensign's research focuses on investigation of microbial pathways of short-chain hydrocarbon oxidation and the biochemical, mechanistic and spectroscopic properties of the enzymes involved in these pathways. He is also a member of the multidisciplinary USU Biofuels Initiative research team.

Ensign, who joined USU's faculty in 1993, was named the 2007 College of Science Faculty Advisor of the Year. He was also one of five faculty members campus-wide to receive this year's inaugural Excellence in Instruction for First-Year Students award.

FACULTY HONORS...
Continued from page 24

Physicist Tom Wilkerson

USU research professor **Tom Wilkerson,** a senior scientist with the university's Space Dynamics Laboratory, is a recipient of the 2007 Utah Governor's Medal for Science and Technology.

Wilkerson, who serves on the faculty of USU's Department of Physics and its Center for Atmospheric and Space Sciences, received the award during a Nov. 13 ceremony hosted by **Gov. Jon Huntsman, Jr.** at Salt Lake City's Clark Planetarium.

The state of Utah awards the Governor's Medal to recognize individuals who have provided distinguished service to the state of Utah in the fields of science and technology. It is the highest honor awarded by Utah for scientific and technological achievements.

Wilkerson is an internationally recognized expert in the use of lasers to perform remote sensing of the atmosphere – known as light detection and ranging or LIDAR. Wilkerson has focused much of his 50-year career on characterizing molecular and particulate matter in the atmosphere and determining how these atmospheric constituents are influenced by human activities.

Throughout his career and his many personal achievements, Wilkerson has maintained a commitment to mentoring young scientists. His former students include a Nobel Prize winner and a Fulbright Scholarship recipient. Wilkerson also shares his passion for science with K-12 students.

Wilkerson has been a senior scientist at SDL since 1997 and with USU's Physics Department since 1994. Prior to his arrival at Utah State, he held positions at the University of Maryland and at Princeton University. ■

ADVANCE IN ACTION...
Continued from page 5

"The ADVANCE seed-grant program enriched my academic opportunities enormously because I developed a working relationship with a colleague in another college," she says. "On a personal level, I also gained a friend, someone who makes working at USU even better than it had previously been."

Dehler stresses ways the project met the goals of USU ADVANCE.

"Our project crosses disciplinary and departmental boundaries, bringing datasets and people together," she says. "Not only will these data add significant bulk to the global archaeology dataset, but they will also provide significant geochemical information for understanding the Proterozoic and younger geologic history of southern Colorado."

In addition to their successful NSF proposal, Pitblado and Dehler have published two articles on their research, with a third under review at the journal *Geoarchaeology.* With students from their departments as collaborators, they have presented the results of their ADVANCE-sponsored pilot study at four national and regional archaeological and geologic conferences. Their new NSF grant includes funds for a number of additional USU student research assistants, who will benefit from the opportunity to conduct and present original scientific research. ■

Students in the WSU/USU Cooperative Nursing Program hone their injection skills at the Fall 2007 USU Employee Flu Shot Clinic.

NURSING PROGRAM...
Continued from page 13

goal is to return the person to healthy living and, in the case of terminal illness, allow that person to die with dignity."

Nursing is a process, Reese says. "That's why the simulator is so important to our training. It helps students approach problems, hone their skills, evaluate their actions and think about the big picture." ■

INSIDER GIVING—AGGIES 'WALK THE WALK'

Last year your support lifted the annual fund to a record level - $117,000 – a 47 percent increase over the prior year. We are extremely grateful for your support and confidence in the educational experience we are providing in the College of Science.

I thought of the College of Science recently while watching the *Nightly Business Report*. The host offered comments on recent stock purchases by officers of a corporation. Such "insider buying" was described as a positive sign that those closest to the operation of the firm were optimistic about its current and future prospects.

Just as the sale of shares allows a corporation to finance growth, universities count on donations by alumni and friends to give us the financial means to deliver a rigorous and life-shaping education.

Endowments represent the most impactful resource available to the university to change lives through education. As permanent funds, endowments provide a continuous resource that supports scholarships, professorships and fellowships.

Interestingly, a large majority of the endowments in the College of Science have been established by our faculty – "insiders," if you will, of the closest kind. Through their teaching they witness the difference these gifts make for students and trust the university to effectively use these resources. Their examples of generosity instruct us that one does not have to be Warren Buffet to make a difference through philanthropy.

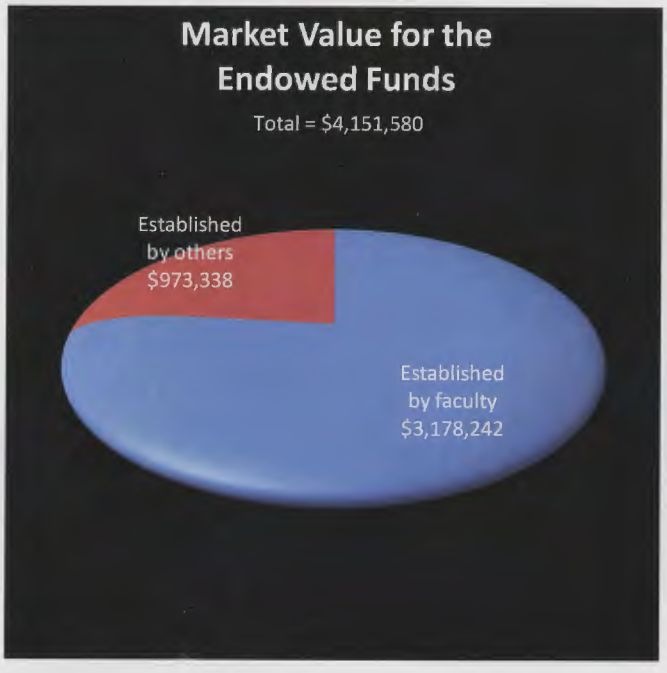
Our nearness to and experience at Utah State give us all a stake in the success of the College of Science and the university. I invite you to make an investment in the future of a student, and Utah State University, by establishing an endowment or making an annual gift. Your support is the key to honoring our tradition and securing our future of academic excellence.

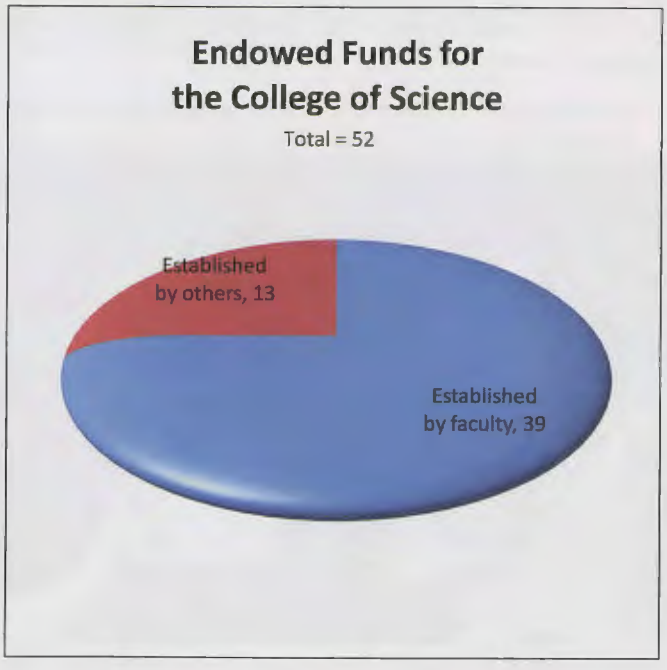
Please don't hesitate to contact me at 435-797-3510 or drop me a line at chris.tallackson@usu.edu if I can provide you with further information.

Again, thank you for your support – I look forward to hearing from you!

Best regards,

Chris Tallackson
Development Director





NEW FACULTY ENRICH COLLEGE

Curtis Dyreson

Assistant Professor
Computer Science

During his undergraduate studies at the New College of Florida, **Curtis Dyreson** received no grades and set his own schedule. "But it was an extremely rigorous school," he says. "The college's motto is 'Each student is responsible for his or her own education.'"

It's a philosophy that's followed Dyreson to Utah State, where he joined the Computer Science Department faculty in August 2007. "Students need to take an active role in their studies," he says.

Dyreson is also a strong advocate for interdisciplinary study – a path he himself followed. As an undergrad he studied medieval and Islamic history; a somewhat unlikely course for a computer science professor.

In Dyreson's case, his current profession grew out of a campus job opportunity. The undergrad, who spent his formative years in New Mexico, Arizona, Colorado and Florida, became the campus expert on the university's IBM Series/1 minicomputer. "I was the card reader operator," he says. "When the director who headed the computer's operation left, I became the director."

Late in his college career, Dyreson stumbled upon an opportunity too good to refuse. "One day, some guy called my friend and said he had a London-based job that involved European travel," he says. "My friend wasn't interested but I jumped at the chance."

After two and a half years in Europe he chose to pursue graduate study in computer science. "I knew I wanted to be an academic," says Dyreson, whose parents **Delmar Dyreson** (computer science) and **Margaret Dyreson** (instructional design) are former USU faculty members.

He completed a PhD in computer science at the University of Arizona in 1994 and subsequently embarked on more international travel. In fact, the intrepid traveler has visited every continent except for South America and Antarctica – but those could be on future itineraries.

Employment opportunities took Dyreson to Denmark's Aalborg University and to James Cook University and Bond University in Australia – the latter the 'downunder' country's only private university. Prior to joining USU, Dyreson served on the faculty at Washington State University for six years.

"My research interests include temporal databases, native XML databases, data cubes and providing support for proscriptive metadata," he says.

Dyreson serves as anthology editor for the Association for Computing Machinery's Special Interest Group on Management of Data and is information director of the ACM's Transactions on Database Systems. He has authored or co-authored 11 articles for refereed journals and more than 30 refereed conference presentations.

Away from the keyboard, he enjoys sports, hiking, camping and mountain biking.

Ludger Scherliess

Assistant Professor
Physics

Though he joined USU's Physics Department in August 2007, **Ludger Scherliess** is hardly a newcomer to Utah State. A native of Germany, Scherliess first arrived in Logan in fall 1992.

"I was only going to be here a short time – two years at the most," he says.

The idea was to explore USU's work in space science and upper atmospheric physics, the topic of his graduate thesis at the University of Bonn, and improve his command of English.

Intrigued with the programs and research opportunities Utah State offered, Scherliess stayed to pursue a doctorate, which he completed in 1997. Postdoctoral research followed at the National Center for Atmospheric Research in Boulder, Colorado.

"It was a great opportunity for me," says Scherliess of his time at NCAR. "But I missed the university environment and the students."

Scherliess returned to Utah State to work with **Professor Robert Schunk** on USU's global ionospheric data assimilation model as part of the U.S. Air Force's Global Assimilation of Ionospheric Measurements (GAIM) program. "The model, which is a weather model for the upper atmosphere, was something really new for the field," he says. "It had never been done before."

Now operational at the Air Force Weather Agency in Omaha, the model is providing a 24/7 window into previously unknown reaches beyond the Earth's stratosphere. "We're seeing surprising

data," Scherliess says. "Until now, we never saw the entire global picture. Now we're seeing connections between weather in the upper atmosphere and the lower atmosphere."

Greenhouse gases on Earth that are causing global climate warming in the lower atmosphere appear to be causing cooling in the upper atmosphere, he says. "We're observing many of the same physical processes in the ionosphere that we see in the lower atmospheres and they impact each other."

Scherliess continues his research, though he's added teaching to his schedule. The two complement each other, he says.

"Teaching provides new insights and a deeper understanding of subject matter," Scherliess says. "There are always new things coming up in classroom discussions."

And though Scherliess, wife **Rita** and daughter **Laura** have made Cache Valley their home they maintain tight knit connections with family back in western Germany, where Scherliess and his wife were raised in rural areas near Cologne.

"We try to visit about once a year and we've also hosted relatives here," Scherliess says.

The frequent trips afford Scherliess the opportunity to indulge in his favorite German delicacies, including brats and *Dominosterne* – a layered gingerbread confection made with marzipan, cherry jelly and dark chocolate icing.

"There's just nothing else quite like it," Scherliess says.

Ethan White
Assistant Professor
Biology

As a middle school student in a junior naturalist program, **Ethan White** discovered a fascination with wildlife study.

"I really got into bat netting," says White, who parlayed his early-acquired skills in zoological research into a successful undergraduate career at Colorado College. He graduated magna cum laude with a bachelor's degree in biology in 1998.

"But by the end of college, I was becoming less inspired by the questions asked about bats using field work," White says. "It was time to focus on the broad, interesting questions of ecology."

To that end, he pursued graduate study in macroecology with scientist Jim Brown at the University of New Mexico. In fact, it was Brown, White notes, along with colleague Brian Maurer, who coined the term "macroecology" back in 1989.

"Our current studies focus on understanding broad-scale patterns of species diversity," he says. "For example, we explore why some areas have more biodiversity than others."

After earning a PhD from the University of New Mexico, he was awarded a National Science Foundation fellowship in biological informatics at the University of Arizona and the University of California-Merced.

Macroecology is a highly collaborative field, White says. "We grapple with difficult questions that require a combination of many different skills and numerous datasets."

His recent research efforts brand White as something of a hybrid himself. His endeavors mingle ecology with computer science and mathematics and he's authored or co-authored more than 20 refereed articles in a range of scientific publications.

As he begins university teaching, White will guide students through the evolution of biogeography. "We'll discuss the foundations of biogeography – that is, understanding why species are where they are," he says. "Then we'll talk about the new focus on macroecology – combining data on many species to understand community and ecosystem-level patterns."

White was among the first students in USU's new Teaching Academy, which prepares new faculty for the rigors of undergraduate teaching.

"It's a great idea – unique to USU – and a big help to me," he says. "I especially benefited from hints and ideas from my peers in the College of Education, some of whom have extensive experience in teaching at primary and secondary school levels."

Beyond the lab and classroom, White enjoys spending time outdoors hiking and pursuing winter sports with wife **Morgan Ernest,** also a faculty member in USU's Biology Department, and their dog, Killian.

"I like the fact that Cache Valley has four distinct seasons," he says. ■

INAUGURAL PROFESSORS
Continued from page 15

A native of Taiwan, Shen earned a bachelor's degree from National Taiwan University and a master's from National Tsing Hua University. He pursued doctoral studies in theoretical gravitational theory at the University of Maryland, where he completed his doctorate in 1985.

Shen has published many peer-reviewed articles in scientific journals. ■

WHO WILL INSPIRE THE NEXT GENERATION OF SCIENTISTS?

HACH SCIENTIFIC FOUNDATION OFFERS USU SCHOLARSHIPS FOR FUTURE TEACHERS

Educating future generations of scientists includes educating future teachers who can foster youngsters' interest in science. This past year, the Colorado-based Hach Scientific Foundation provided funding to Utah State University's Department of Chemistry and Biochemistry to administer two scholarships of $6,000 per year, for up to six years, to students committed to becoming high school chemistry teachers.

USU's first Hach Scholarship recipient is **Nicole Brinck**, who transferred to campus this past fall after completing studies at Snow College, a two-year state college in Utah's Sanpete Valley.

"I'm really excited about receiving the scholarship and studying at USU," says Brinck, who graduated from Salt Lake County's Bingham High School in 2005.

Brinck admits that chemistry wasn't her favorite subject in high school. "I really didn't do well in chemistry but I started college as a pre-pharmacy major and chemistry was required," she says.

While taking chemistry at the college level, Brinck discovered she enjoyed the subject. "I had the opportunity to lead study groups and, all of a sudden, I loved chemistry," she says. "It's what I'm really good at."

Brinck says she looks forward to taking USU's biochemistry courses – studies not offered at her previous alma mater – along with other upper division science courses.

"I've heard a lot of good things about Utah State's science program from my friends and from my brother, Cory, who studies electrical engineering at USU," she says.

Beyond the classroom, Brinck hones her teaching skills as a pool lifeguard and swimming coach. She instructs fledgling swimmers ages three to 15 and coaches competitive swimmers from elementary to middle school-age. "In that environment, you learn what motivates kids and how to lead them, step by step, through new concepts," she says.

The length of the Hach Scholarship is intended to encourage students to pursue upper-level chemistry courses beyond those required for secondary school teaching. The foundation stipulates that USU can support two students at a time; additional scholarships will be awarded as the first recipients graduate.

USU transfer student Nicole Brinck is the first recipient of a Hach Scholarship, offered through the Department of Chemistry and Biochemistry.

USU's Chem/Biochem Department will award the second scholarship in 2008. The submission deadline is Feb. 15, 2008 and applications are available from the department. For information, visit the department's Web site at www.chem.usu.edu and select "Undergraduate," then "Hach Scholarship" or contact Steve Scheiner, department head, at scheiner@cc.usu.edu.

The foundation also offers second career scholarships to professionals who wish to return to college to become high school chemistry teachers. For information, visit www.hachscientificfoundation.org.

The Hach Scientific Foundation was established in 1982 by Clifford and Kitty Hach, founders of The Hach Company. According to its Web site, the foundation's mission is to foster and support science and science education, and to make evident the interdependence between science education and the public. Utah State joins about 20 colleges and universities designated to administer scholarships funded by the foundation. ■

SCHOLARSHIP OPPORTUNITIES

Are you seeking scholarship opportunities for your child, grandchild, a friend or perhaps yourself? Visit USU's Financial Aid Office Web site at www.usu.edu/finaid/scholarships.

USTAR UPDATE

USU WELCOMES NEW RESEARCHERS TO CENTER FOR ADVANCED NUTRITION

In March 2006, the Utah State Legislature passed Senate Bill 75 creating the Utah Science Technology and Research (USTAR) initiative. This measure provided funding for strategic investments at Utah State University and the University of Utah to recruit world-class researchers and build state-of-the-art interdisciplinary research and development facilities with the aim of forming first-rate science, innovation and commercialization teams across the state.

New USTAR researchers at Utah State include **Michael Lefevre** and **David C. Ward** who join USU's Center for Advanced Nutrition.

Lefevre comes to USU from Louisiana State University's Pennington Biomedical Research Center, where he served as chief of the division of functional foods research. He also served as professor in the division of nutrition and chronic diseases and was an adjunct professor at the School of Human Ecology.

Lefevre is a fellow of the American Heart Association, belongs to the Council on Arteriosclerosis; the Council on Nutrition, Metabolism and Physical Activity; the Council on Epidemiology and Prevention; and is a member of the American Association for the Advancement of Science and the Institute of Food Technology. His research focus includes the role nutrition plays in the development of cardiovascular disease.

Ward is deputy director of the Nevada Cancer Research Institute. He will give USU just under 20 percent of his time and is appointed as an adjunct professor of chemistry. He is internationally recognized for his research in the fields of molecular cytogenetics, cancer genetics, virology and optical imaging technology.

The mission of USU's Center for Advanced Nutrition is to conduct research to develop an understanding of nutrition from the whole organism to the molecular level. The Center will use this knowledge to develop new technologies, approaches and educational tools that promote and benefit health in human populations or is of value to the agricultural community or food industry.

For more information, visit the Center's Web site at www.can.usu.edu. ■

ADVANCING DIVERSITY...
Continued from page 5

16 years, with no promotions in the four years immediately prior to the start of ADVANCE.

The advancement goal of the USU ADVANCE team is two-fold: First, to encourage promotion of women from associate to full professor in the STEM departments. A second goal is to encourage promotion rates of women equal to those of men. These goals have been met and exceeded at Utah State. Six women have been promoted to full professor during the Utah State ADVANCE project. In 2005, 2006 and 2007, a higher percentage of women associate professors were promoted to full professor than men associate professors in the STEM disciplines.

"ADVANCE's influence on USU's campus is unmistakable," says Kalbas-Schmidt. "As the grant embarks on its final year, its impact will be felt by both current and future generations of faculty, administrators and students on this campus. ADVANCE has definitely left a very distinctive imprint at Utah State University." ■

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KEEPING IN TOUCH

1960s

After serving as associate provost for 16 years at the University of San Diego, **Dr. Donald McGraw** (MS **1967**, Bacteriology), Chula Vista, California, began his own federal contracting business in 2004. His business specializes in archival research and writing, especially in the life sciences, and has had contracts with the U.S. Fish and Wildlife Service and other agencies. McGraw recently published *Edmund Schulman and the Living Ruins,* a biography of Dr. Schulman, the scientist credited with discovering the age of ancient bristlecone pines. McGraw was a student of the late **Winslow Whitney Smith,** USU professor of bacteriology and public health, who, McGraw says "confirmed my interest in the history of the life sciences."

Dr. Donald McGraw

Kent J. Voorhees (BS **1965**, MS **1968**, PhD **1968**, Chemistry), Golden, Colorado, has been re-elected to the board of directors of the American Chemical Society. He begins a second three-year term Jan. 1, 2008, as director-at-large. A chemist and professor at the Colorado School of Mines, Voorhees' honors include the 2001 USU Chemistry Alumni Award, CSM's 2003 Dean's Excellence Award, the ACS Colorado Section's 2006 Marvin Goldberg Service Award, Who's Who in America and Who's Who in the World.

FOLD FOLD

1970s

Sigma Space Corporation announced the appointment of **Mary L. Cleave** (MS **1975** Biology, PhD 1980, Civil & Environmental Engineering) to its board of directors, effective Oct. 1, 2007. A veteran of two space shuttle flights, Cleave flew as a mission specialist aboard STS-61B in 1985 and STS-30 in 1989, logging more than 10 days in space. She previously served as associate administrator for NASA's Science Mission Directorate and deputy associate administrator (advanced planning) in the Office of Earth Science at NASA Headquarters.

1980s

Janet de Vries (MS **1982,** Geology), Casper, Wyoming, received the Wyoming Community College's 2007 Trustees Award for Professional Staff/Faculty of the Year. She serves as director of the career center at Casper College.

FOLD FOLD

ALUMNET

Dear College of Science Alumni and Friends,

We'd like to hear from you! We hope you'll take a moment to drop us a line. No postage is required. You simply fold this sheet on the dotted line, tape it shut, and drop it in the mail. You can also e-mail information to ***maryann.muffoletto@usu.edu*** *or fax us at (435) 797-3378.*

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OTHER DEGREE(S) _____ YEAR(S) _____ SCHOOL(S) _____

PROFESSION/EMPLOYER _____

PROFESSIONAL/PERSONAL AWARDS _____

BOOKS PUBLISHED _____

ABOUT YOURSELF _____

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Insights *is the alumni newsletter of Utah State University's College of Science. Our mission is to inform alumni and friends of current events, research and news within the college. The newsletter also provides a forum for alumni to follow the careers and professional development of their colleagues.*

This issue of **Insights** *was produced by Editor/Writer Mary-Ann Muffoletto, with special thanks to Dean Mary Hubbard, Associate Dean Richard Mueller and Associate Dean Lisa Berreau. Photography by Donna Barry, Mary-Ann Muffoletto and Richard Mueller. Graphics by Bobbi Chatterton. Design by Megan Hemmert. Printed at USU Publication Design and Production.*

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