

Insights

college of science
FALL 2008

Breaking LIMITS

Legacy of Utah State Award recipient
and Hintze, right, explores molecular
puzzles with faculty mentor Sean Johnson

Utah State University

After the passing of my first year, I can say that it has been a true delight to work with the team of College of Science faculty, students and office staff to move our college forward. I have seen stellar faculty rise as award winners in teaching and research and I have seen students present cutting-edge research. Working with leaders from across campus has also made it clear to me that Utah State University is a place with a great past and a bright future.

Academic Excellence

College of Science students brought the university recognition with a national award in the field of Physics, Goldwater Scholar awards and a strong presence at Utah's Undergraduate Research on Capitol Hill Day. Our 2007-08 graduates have now gone on to medical school, graduate school and competitive science and mathematics careers. Indicators such as MCAT scores well above the national average attest to the quality education that our College of Science students are receiving. I have heard from employers and graduate advisors from across the country that our undergraduates are among the best prepared when they arrive in their new positions following graduation from USU. Hats off to our faculty for the role they play in training our students.

Advanced Science Training

The national need for more and better scientists has provided us with the nudge to examine our programs to determine even better ways to recruit and train science and math students. Four of the six College of Science departments have just engaged in facilitated priority-setting sessions aimed at identifying niche areas that meet student interests, employer demands and funding opportunities. Over the next few years these departments will work to build strength in areas that will increase their global competitiveness. This is one step toward meeting the national need for science training.

Strengthening STEM Education

Another effort in which the College of Science is engaging is a partnership with the Emma Eccles Jones College of Education and Human Services to develop strength in the area of STEM (Science, Technology, Engineering and Mathematics) education. College of Science departments play a big role in training secondary educators in the fields of science and mathematics. Utah has a growing demand for highly qualified

science and math teachers and our new partnership will strive to recruit more students to STEM education fields and to work on encouraging some of our strongest students to go into education careers. As we increase degree offerings at regional campuses, we hope that more and better educators will come from those programs as well.

Medical and Health-related Career Education

As I have talked with College of Science students and alumni this year, it has become clear to me that many of our students choose careers in medical and other health-related careers. Further investigation revealed that USU offers many programs, across colleges, that prepare students for these career paths. This realization prompted several meetings with an array of faculty who direct these programs. These meetings led to the development of a Web site to help guide current and prospective students through the health career pathways offers at USU. See www.usu.edu/medical for the beginnings of this Web portal.

I look forward to the 2008-09 academic year as I get to know our alumni, my administrative colleagues, faculty, staff and students better. At the beginning of fall semester I had the privilege of spending four days with a section of our freshman orientation Connections program. It will be a real treat for me to follow this group of first-year students through their next few years of a wonderful Aggie experience.

Go Aggies!

Dean Mary Hubbard



Dean Mary Hubbard, left, hikes with freshman Connections participant Ashley Ewaniuk to a service project near campus at Logan Canyon's Stokes Nature Center.



Insights

FALL 2008

ON THE COVER

Biochemistry undergraduate Bradley Hintze, right, and his faculty mentor Sean Johnson are deciphering the structure and mechanism of proteins. Cover photo by Donna Barry.

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

Editor and principal writer for *Insights* is Mary-Ann Muffoletto. Special thanks to Dean Mary Hubbard, Associate Dean Richard Mueller and Associate Dean Lisa Berreau for editorial oversight, Bob Wood for computer support, Bobbi Chatterton for mailing list coordination and university photographer Donna Barry. Design by Holly Broome-Hyer. Printed at USU Publication Design and Production. © 2008

USU College of Science
0305 Old Main Hill
Logan, Utah 84322-0305 USA
Tel 435.797.2478
scido@usu.edu

2 FEATURES

- Ignoring Limits
- Simple Boost for the Cognitively Impaired
- Geologists Peer into Fault's Past
- Head in the Clouds, Feet on the Ground
- Regional Campus Opens Path to Med School
- Seeking Weapons of Mass Reduction

12 ALUMNI FEATURE

- A Lifelong Gift

14 ALUMNI NEWS

- USU Rhodes Scholar Marks Academic Milestone
- Physics Alum Named Space Dynamics Lab Head
- Alum Lars Peter Hansen Wins National Math Award

17 COLLEGE NEWS

- Making the Grade, Making a Difference
- Taking Out the Trash
- College of Science Unveils New Web Site
- College of Science Home to 'Golden Scholars'
- Student Chem/Biochem Club Receives National Recognition
- USU Physics Day to Celebrate 20th Anniversary
- Richard Cutler Named Math/Stat Department Head

27 GIVING BACK

28 TRANSITIONS

28 IN MEMORIAM

29 KEEPING IN TOUCH

Visit us on the Web at www.usu.edu/science



Undergrad biochemist Brad Hintze (left) and USU mathematics lecturer, Bryan Bornholdt, competed in the 206-mile, 2007 LOTOJA bike race.

Ignoring **LIMITS**

Legacy of
Utah State Award recipient
Bradley Hintze solves
molecular puzzles

Utah State University undergraduate biochemist Bradley Hintze is not only excelling in his studies, he's a 2007 finisher of the nation's longest one-day bicycle race sanctioned by the United States Cycling Federation.

Impressive, yes. But even more remarkable is Hintze's perseverance in the face of significant physical obstacles. He has difficulty holding his head upright and walks with a limp. Lack of fine motor skills makes writing difficult and precision lab techniques impossible.

"I'd be a disaster at the lab bench," says Hintze, revealing his characteristically subtle sense of humor.

Born with mild cerebral palsy, Hintze's physical disabilities initially seemed minor. But at puberty, he developed cervical dystonia that became progressively worse. The neurological movement disorder of the neck, for which there is no known cure, causes Hintze's head to involuntarily twist and turn to one side.

"Brad has a great enthusiasm for science and I love having him in our lab," says Sean Johnson, Hintze's faculty mentor and R. Gaurth Hansen Assistant Professor of Biochemistry. "I am constantly amazed at his abilities and drive. I have never heard a word of complaint or frustration regarding his physical challenges. He doesn't seem to let anything prevent him from succeeding in whatever it is he wants to do."

In spring 2008, USU honored the Aggie senior with the university's Legacy of Utah State Award. The honor was created in memory of the agricultural students and instructor involved in the 2005 USU van ac-

12.8/1.38
Fall 2008



cident. It is given annually to a student who embodies the true spirit, heart and soul of Utah State and demonstrates love and support for the university family, while leading with a vision of hope for the future.

"Brad's dedication to science is clear," says Johnson. "He is one of the most inquisitive students I have ever met, and his influence is felt throughout our department. One of the top performing students in our departmental courses, Brad is constantly sought out by other students who are struggling to understand the coursework."

Hintze, a Willard L. Eccles Undergraduate Research Fellow, has carved his niche in computer-based biochemistry research in Johnson's x-ray crystallography lab. Along the way he's proven to himself and others that, with determination and persistence, individual strengths and talents can emerge in spite of physical limits.

Despite a busy academic schedule Hintze found time to squeeze in nearly 4,000 training miles with USU mathematics lecturer and tandem bike partner Bryan Bornholdt in preparation for the grueling LOTOJA. The 206-mile bike race starts in Logan, Utah and finishes in Jackson Hole, Wyoming. Participants climb and descend three mountain passes in the race's first 110 miles in unpredictable September weather that can range from scorching heat to sudden snow squalls.

"Our Logan to Jackson ride was remarkable," Bornholdt says. "Yes, we prepared for it but it still demanded a great deal of heart and determination. Bradley has these traits in spades."

Bornholdt recounts that, at the LOTOJA awards ceremony, a race

participant walked up to Hintze and thanked the Aggie student for his inspiration.

"The man told Bradley that, when we passed him, he was about ready to give up," he says. "But he decided if Bradley was still riding, he would keep riding. He moved in behind us and rode with our group the last 11 miles. He was in tears as he spoke to Bradley."

In Johnson's lab, Hintze uses x-ray crystallography techniques in combination with biochemical analysis to understand the structure and mechanism of proteins.

**"I AM CONSTANTLY AMAZED
AT BRAD'S ABILITIES AND
DRIVE ... HE DOESN'T SEEM
TO LET ANYTHING PREVENT
HIM FROM SUCCEEDING IN
WHATEVER IT IS HE WANTS
TO DO."**

**— SEAN JOHNSON,
R. GAURTH HANSEN
ASSISTANT PROFESSOR OF
BIOCHEMISTRY**

"Our goal is to get a picture of the protein based on x-ray diffraction," he says.

During USU's 2008 Research Week, Hintze presented his lab's efforts in determining the crystal structure of a protein complex called TRAMP, found in brewer's yeast.

"TRAMP is a protein complex that's involved in RNA degradation in the nucleus," he says. "It identifies RNA substrates that need to be

degraded and labels them — much like a lumberjack identifies and tags trees in a forest that need to be cut down."

The project gives scientists a structural view of cell components that play a central role in nuclear RNA surveillance, Hintze says. "RNA surveillance is a widespread cellular process that is critical for cell function and viability."

A 2001 graduate of Utah's Alta High School, Hintze was initially timid about pursuing university studies. "I thought college wasn't an option for me; that it would be way too difficult."

With encouragement from a Salt Lake vocational rehabilitation center, he entered USU in Fall 2003. Testing the waters with ten credits, he earned a 4.0 GPA during his first semester. A general biology course his second year, taught by professors Keith Mott and Greg Podgorski, captured his interest but, at first, shook his confidence.

"I was nervous but my advisor, Cathy Myers-Roche, encouraged me to keep trying," Hintze says.

After his first big test, he emerged with a nearly perfect score. "That, right there, gave me more confidence in my collegiate career than anything else," he says.

The course, along with subsequent science courses, steered him to biochemistry.

"I thought, 'this is so cool' and I wanted to do research," Hintze says. "The research we're doing now, determining the structure of TRAMP, has never been done before. We're getting information that's never been known. That fascinates me."

—Mary-Ann Muffoletto



USU computer scientists Aliasgar Kutianawala, left, and Vladimir Kulyukin are developing an intelligent walker for people with cognitive impairments.

Simple Boost for the Cognitively Impaired

A specialized walker developed by USU computer scientists offers greater mobility and independence for Alzheimer's patients

Providing a means of maintaining mobility and independence to those whose cognitive abilities are failing is a challenge. Utah State University computer scientists are developing a specialized walker that could improve the quality of life for individuals affected by Alzheimer's disease and other dementia-causing illnesses.

"By 2030 one out of five Americans will be over the age of 65," says Vladimir Kulyukin, associate professor in USU's Department of Computer Science and director of the Computer Science Assistive Technology Laboratory. "One of the faculties people lose with age is cognition."

Kulyukin and doctoral student Aliasgar Kutianawala created the "iWalker" – intelligent walker – to help cognitively impaired people complete basic tasks of everyday living. The pair is conducting the project in collaboration with AT Sciences, an assistive technology company based in Pittsburgh, Pa., the University of Pittsburgh School of Nursing and the University of Pittsburgh Department of Rehabilitation Science.

Seed money for the project was provided by two

USU Community University Research Initiative grants. Subsequent funding has come from a contract with AT Sciences and grants awarded by the National Science Foundation and the National Institutes of Health.

"The intention of the iWalker is to take someone where they want to go," Kulyukin says. "Perhaps you leave your room and, halfway there, you forget where you are and where you're going. iWalker reminds you of where you are and the direction you're traveling."

The iWalker is a wheeled walker – or rollator – and operates within a smart world perspective. That is, its on-board computer provides visual and audible cues activated by sensors embedded in the user's environment.

"As the iWalker rolls over a sensor under the carpet, it announces its location – such as 'water cooler' or 'restroom,'" Kulyukin says.

In addition, the walker's screen flashes a picture, words or an arrow with information about the location. "The nurses collaborating on the project tell us that some patients react better to audible feedback and some react better to visual feedback," he says.

Kulyukin stresses that the iWalker is not a robot. "It doesn't think for itself. Rather, it reads information from radio frequency identification (RFID) tags placed throughout the environment where it is used."

The distinction is important, he says. iWalker was designed in this manner to keep its cost low.

"Other researchers have designed robots to assist the elderly, but these devices are prohibitively expensive," Kulyukin says.

The main cost with implementing the iWalker is installing RFID tags under carpeting and other flooring throughout a facility. But once the infrastructure is in place, the cost per user – walker – is relatively inexpensive.

Clinical tests conducted with the iWalker at the University of Pittsburgh have received encouraging reviews.

"Both caregivers and users reacted positively to the device," Kulyukin says. "They like the simplicity of the iWalker."

'Simplicity' was the aim of the project from its inception. "We decided early on that building a smart device or a device that could avoid obstacles was unnecessary," he says. "Most people with Alzheimer's can see. They just need help remembering."

And a little help can make a big difference when people lose skills most take for granted.

The longer disabled individuals can maintain their independence the better, Kulyukin says. "Postponing the need for institutionalization reduces costs, and it also enables people to remain in a home setting, if they choose."

—Mary-Ann Muffoletto



Geologists Peer into Fault's Past



With a grant from the National Earthquake Hazards Reduction Program, geology graduate student Stephanie Davi is studying the East Cache Fault.

Three trenches scooped out of a northern Utah hillside are bringing geologists a bit closer to knowing when the last big earthquake hit southern Cache Valley and, importantly, when another one could be due.

Stephanie Davi, a Utah State University graduate student in geology, is using a grant from the National Earthquake Hazards Reduction Program to advance the knowledge about the East Cache Fault that runs north-south for about 50 miles on Cache Valley's east side.

So far, she can't say whether an earthquake occurred here in the past 10,000 years. But if one did, it would be considered recent enough to influence how development takes place in this tucked-away part of the valley some 12 miles south of Logan, said her USU faculty advisor, Jim Evans.

"This could have an impact on determining the risk,"

The area is feeling development pressure. There is a proposal to turn Powder Mountain into a year-round

East Cache Fault, site of proposed resort and Ruby Pipeline, feeling development pressure

resort with paved access from Cache County. And the proposed Ruby Pipeline would cross the valley's south end, carrying natural gas from Wyoming to Oregon.

Though it's too soon for conclusions, Davi believes portions of the fault exposed by her easternmost trench - it's on what has been considered the fault's main strand - may be far older than 10,000 years. Sediment testing will be used to determine when the area was last disturbed, but the fault could be 4 million or 5 million years old. If so, there may be an unmapped fault nearby that is the true main strand, she said.

"Perhaps the energy has been shifted to a fault farther west," she said. "There may be a fault there that is not even on the map."

If funding can be arranged and permission from the property owner secured, Evans and Davi would like to extend her trench 30 or 40 feet to the west.

With the help of a backhoe crew, Davi dug two trenches on other suspected strands of the fault last fall.

She could not find it in her middle trench, either because the sediment was too deep or she missed it by a few feet. That sediment is being tested to determine when it was last disturbed, Davi said.

But the westernmost trench, dug at the shoreline of the ancient Lake Bonneville where geologists previously suspected a fault, found none at all.

Chris DuRoss, a Utah Geological Survey geologist who toured the trench with Davi and other geologists, said the East Cache Fault has not been nearly as active as the Wasatch Fault, which stretches 220 miles along the Wasatch Front. But little is known about East Cache Fault - except in the central section near Logan, where studies indicate an earthquake occurred in the past 4,000 to 5,000 years. That's a mere blink in geologic time.

Davi's are the first trenches on the southern part of the fault.

"The idea is to get in here to piece together the history," DuRoss said.

—Kristen Moulton
The Salt Lake Tribune
Reprinted with permission.



Goldwater Scholar Jodie Barker-Tvedtnes and her young daughter Kalila marvel at the wonders of the night sky.

Head in the *Clouds,* Feet on the *Ground*

Goldwater Scholar Jodie Barker-Tvedtnes

Receives National Physics Award

Goldwater Scholar Jodie Barker-Tvedtnes is a recipient of a 2008 Outstanding Student Award for Undergraduate Research from the Society of Physics Students. One of just three undergrads in the nation honored with the award, the physics major received an all-expenses-paid trip to the International Conference of Physics Students Aug. 6-13 in Cracow, Poland.

"I'm very excited about this honor and the opportunity to meet with physics students from around the world," says Barker-Tvedtnes,



who was invited to present her research in Poland and at the SPS national meeting in spring 2009.

The undergrad's award also includes a cash award for USU's SPS chapter, a group that Barker-Tvedtnes helped revive when she arrived on campus on a Presidential Transfer Scholarship from Salt Lake Community College a few years ago.

"The chapter was essentially dormant when I got here," the Salt Lake City native says. "But when I learned about the opportunities SPS offered – national scholarships, projects, activities – I worked with faculty and fellow students to get it going again."

"Jodie is a power house of activity and capability," says her mentor Mike Taylor, physics professor. "She's an excellent leader, displays exceptional poise and has a strong experimental aptitude."

He notes that, while tackling a significant academic load and research efforts, Barker-Tvedtnes coordinated chapter gatherings and field trips for students along with community outreach projects, including the chapter's popular stargazing parties on the USU quad.

With Taylor, Barker-Tvedtnes studies the mesosphere's mysterious noctilucent clouds – also known as polar mesospheric clouds or PMCs – which form at the edge of space.

"PMCs are ice clouds that form in the summer months near the extremely cold mesopause region – some 50 miles above the earth," says Barker-Tvedtnes, a Willard L. Eccles Undergraduate Research Fellow. "From the ground, these noctilucent or 'night-shining' clouds are only visible during twilight hours at high latitudes."

She spent five weeks in Alaska last summer studying the elusive formations with Taylor and fellow students. Taylor is a member of NASA's science team for the Aeronomy of Ice in the Mesosphere or "AIM" mission.

NASA launched the AIM satellite into orbit April 25, 2007, to collect information on how and why

**"JODIE IS A POWER HOUSE
OF ACTIVITY AND CAPABILITY.
SHE'S AN EXCELLENT
LEADER, DISPLAYS
EXCEPTIONAL POISE AND
HAS A STRONG EXPERIMENTAL
APTITUDE."**

**—MIKE TAYLOR,
PHYSICS PROFESSOR**

PMCs form. During their summer trip, Taylor and his student team captured data from two field sites, located about 30 miles apart on the tundra of eastern Alaska and western Canada, to compare with data received from the AIM satellite.

"We became nocturnal," Barker-Tvedtnes says, although, because of the latitude of the areas in which the team was working, it never became completely dark.

"Starting at midnight each day, we'd have about five hours of twilight," she says. "We'd spend those hours tracking noctilucent clouds across the horizon and photographing the formations with digital and video cameras."

Back in Logan, Barker-Tvedtnes is comparing the ground-based data with information captured by the satellite. She presented her research in a number of forums, including regional physics conferences and USU's undergraduate research showcase this past spring. Following graduation next spring she plans to continue her studies at the graduate level and conduct research in upper atmospheric physics at a government or academic institution.

Barker-Tvedtnes' dedication is all the more remarkable considering she's a single mom, juggling work, study and physics chapter duties with the care of her 7-year-old daughter, Kalila.

Balancing responsibilities is a challenge, she admits, but receiving the Willard L. Eccles fellowship has afforded her the opportunity to spend time in the lab and have greater control of her schedule.

"My work allows me the flexibility to conduct research while my daughter is in school and keep my evenings free for her," Barker-Tvedtnes says. "I've also appreciated the support from my professors. They really make an effort to involve students in undergraduate research."

—Mary-Ann Muffoletto



Regional Campus Opens Path to

MED SCHOOL

Uintah Basin farmer
pursues dream of
becoming a
physician



Study at USU Uintah Basin propelled farmer Clint McKee toward his dream of entering medical school.

Clint McKee's unconventional path to medical school included several unplanned detours, a flat tire or two and more than a few potholes. Before earning his undergraduate biology degree in 2005 at Utah State University's Uintah Basin Campus, he nearly shelved his dream of becoming a physician. But encouragement from his professors, coupled with McKee's gritty tenacity and a few bane-turned-blessing moments, fueled his passion toward what he considers his true calling.

"I decided at age 14 that I wanted to become a doctor," says McKee, one of 12 children raised on a family dairy farm in eastern Utah. "But I'd never met anyone who went to med school and had no idea what it took to get there."

Now in his second year of medical school at the University of Utah, the 30-year-old husband and father of five revels in opportunities to immerse himself in the study of the intricacies and nuances of the human body.

"Despite the academic demands, it feels like a luxury," McKee says. "I wasn't sure what to expect when I entered med school but I feel I was exceptionally well prepared and I've done very well in my classes."

His undergraduate career began less favorably. Just a year or so into his studies at an urban campus in Utah, McKee, newly married and eager to start a family, struggled to balance the demands of work, school and home.

Something had to give and that something was school.

"Most of the classes I needed were offered during the daytime and it was hard to find a job with the flexibility to accommodate school," he says.

During a visit home to his parents' farm, McKee spied a class schedule his sister was reading about USU's Uintah Basin Campus. "I noticed that a number of courses in biology, chemistry and calculus were offered in the evenings."

The timing was auspicious. McKee's father, Mike, was elected to serve on the Uintah County Commission and needed help with the family farm. Managing the farm by day and study by night seemed like a good fit for McKee.

"The advisors at USU were great," he says. "They looked at my fractured transcripts and helped me get back on an academic track."

The scheduling worked but the workload wasn't easy.

"I remember Clint occasionally being late because a tractor got stuck or he had to handle some other incident on the farm," says Lianna Etchberger, assistant professor of biology at USU Uintah Basin. "Yet he was a bright and dedicated student – eager to learn and full of perceptive questions."

"I'd show up for class straight off the farm – filthy, tired," McKee



says. "But the professors were phenomenal. I loved the small classes, one-on-one instruction and flexibility."

Upon graduation, McKee still wanted to pursue medicine but wondered if a less arduous academic path might be better suited to his growing family. His planning was interrupted when he and his wife, Kathryn, learned that their unborn child had serious heart problems. Delivered by emergency caesarean section, baby Sarah was rushed to Salt Lake's Primary Children's Medical Center for treatment.

The outcome was joyous and McKee marveled at the physicians' skills. "It dawned on me that, if not for doctors, my daughter, my wife, and my twin sons – who also faced a medical crisis at birth – would not be here," he says. "It was an epiphany and reinforced my determination to become a doctor."

McKee embarked on the detailed medical school application process, including studying for the medical school entrance exam or 'MCAT.' "I had about a year's worth of preparation to complete and realized that I needed more research

experience," he says.

Etchberger urged him to contact biologist Paul Cliften at USU's Logan campus, who was seeking a research technician.

"Clint had only a fraction of the experience of the other applicants," Cliften says. "But I was impressed with his curiosity and knowledge and hired him. I figured I would likely never have another opportunity to help train someone of his caliber."

Months later, glowing recommendations from Cliften and Etchberger were included in McKee's successful medical school application.

"I feel like I received a great education from USU," McKee says. "And the support I received from my professors helped me achieve my dream."

—Mary-Ann Muffoletto



McKee with his family, from left, wife Kathryn holding baby Miriam, sons David, Joseph and Joshua and daughter Sarah. (Above)

Now in his second year of medical school at the University of Utah, McKee revels in opportunities to immerse himself in the study of the intricacies and nuances of the human body. (Right)





USU USTAR professor Michael Lefevre explores the role of diet in the development of cardiovascular disease and type 2 diabetes.

Seeking WEAPONS of Mass REDUCTION

USTAR researcher explores
nutritional tools to combat
modern-day plagues

Each new year brings renewed rounds of resolutions, among which losing weight and developing healthier habits consistently rank in the top five. Just as predictable are a bevy of newly released ads touting the latest in weight loss diets and tools for wishful fitness enthusiasts.

Grapefruit, cabbage and reverse diets ... Israeli Army, Atkins, Eat-Right-for-Your-Type diets ... and 2008's offering: the GenoType Diet.

"The ability to determine a proper diet based on your genotype is premature," says Utah State University researcher Michael Lefevre. "We know that both genetic and non-genetic factors play a role in how an individual responds to different diets, but we don't yet know why."

Lefevre, who was recruited to USU through the Utah Science, Technology and Research – USTAR – initiative, has long studied the role of diet in the development of cardiovascular disease and type 2 diabetes.

"We know that lowering saturated fat and increasing plant sterols and fiber in one's diet can lower cholesterol levels," says Lefevre, who joined USU's Center for

Advanced Nutrition in September 2007. "But everyone responds differently to diet changes and we need tools to help us identify the best diet match for each person."

Lefevre believes that a metabolomics approach – rather than a genomics approach – may provide those tools. Metabolomics is the systematic study of the unique chemical 'fingerprints' that specific cellular processes leave behind.

To test his approach, he's setting up a metabolic research kitchen with the ability to feed up to 25 human subjects at a time. The Center recently hired a research dietitian and a clinic coordinator to help run studies. In related developments:

- USU broke ground Oct. 17 on a \$60 million, 110,000-square-foot USTAR facility on the university's Innovation Campus research park in North Logan. The facility, designed to meet high standards of sustainability, will house the Center for Advanced Nutrition as well as USU's Cache County Study on Memory, Health and Aging.
- The university has renovated space within 'The Junction' – an on-campus student dining facility – to provide the Center with a research kitchen as the USTAR building project proceeds.
- The Center is collaborating with Dr. Jim Davis, medical director of the USU Student Health and Wellness Center, and will be working with Health and Wellness Center for participant screenings and assessments.
- The Center has just received Institutional Review Board approval to conduct their first human nutrition study – which will look at the effects of plant compounds on blood cholesterol levels.



"We will provide all meals for the people in each study, the length of which could last from three to four weeks or up to six months," he says. "The findings should help us begin to identify specific genetic and non-genetic markers and tailor the appropriate diet to each individual."

"If your company is a player in the natural products industry, you need to take notice of the work at USU," says Ted McAleer, USTAR Executive Director. "The Center for Advanced Nutrition is moving into some research areas that have exciting commercialization potential."

USTAR is excited to facilitate dialogue between industry and the USTAR research teams, McAleer adds.

Food is not always the enemy, says Lefevre, who studies so-called functional foods; that is, nutritional compounds in foods that inhibit disease. Examples include antioxidants that are often lauded for their health benefits. The compounds, praised for their cancer prevention and anti-aging properties, are so ubiquitous in food, he notes, that whether or not they deserve such credit is open to debate.

His current research focuses on bioactive compounds, including flavonoids found in many fruits and vegetables. Early studies indicate that such compounds may offer protection against cardiovascular disease and cancer.

Lefevre continues his work with Louisiana State University's Pennington Biomedical Research Center, his former employer, on a National Institutes of Health-funded botanical research project that is examining how bioactives in fruits' plant pigments affect health. The rich blue and red hues of your favorite berries and grapes could be doing more good for you than simply pleasing your senses.

"Plant pigments may provide protection against metabolic syndrome or insulin resistance – a precursor to type 2 diabetes," he says.

Finding the right tools, including improved nutrition, to combat modern-day plagues is critical, he says.

"Today's obesity epidemic is unprecedented," Lefevre says. "We have access to a large supply of relatively inexpensive food – much of which is high in fat and salt."

He also notes that today's lifestyles encourage inactivity.

"Consider this: we actually press a button to remotely start our cars and open their doors," Lefevre says. "The simplest tasks have been reduced to one finger. We have

escalators instead of stairs and we sit at computers all day. These little things add up in our lives. It's amazing how few calories we actually need when we're inactive."

Personal choice is a factor in good health but public policy encouraging healthy habits, including pedestrian and bike-friendly communities, could discourage overly sedentary lifestyles, he says.

"Reversing current trends requires action from all of us on personal and communal levels," Lefevre says.

—Mary-Ann Muffoletto
with contributions from USTAR



USU broke ground Oct. 17 on a 110,000-square-foot USTAR building on Innovation Campus in North Logan. Rendering courtesy of AJC Architects.

What is USTAR?

The Utah Science, Technology and Research initiative (USTAR) is a long-term, state-funded investment to strengthen Utah's "knowledge economy" and generate high-paying jobs. Initiated in March 2006 by the State Legislature, USTAR is based on three program areas. The first area involves funding for strategic investments at the University of Utah and Utah State University to recruit world-class researchers. The second area is to build state-of-the-art interdisciplinary facilities at these institutions for the innovation teams. The third program area involves teams that work with companies and entrepreneurs across Utah to promote science, innovation, and commercialization activities. For more information, visit www.innovationutah.com.



Donna Barry

1947 USU graduate Marie Veibell enjoys playing a part in the university's growth through annual donations she has made over the past 50 years.

A Lifelong **GIFT**

Chemistry Alum Marie Veibell
is a longtime supporter of
USU students

When Marie Veibell graduated from Utah State University in 1947, the campus had 29 buildings and 4,068 students, up from 920 in 1944 during World War II. During the last 61 years, USU has seen tremendous growth in these areas. Today there are nearly 200 buildings and more than 23,000 students, and Veibell has enjoyed playing a small part in this growth.

"People need a little help sometimes, and if you can help one person, then they can help somebody else, and it's a great cycle," she says. "I started giving just a little bit to Utah State a few years after I graduated, once I'd had time to get established, and I've given every year since."

She enjoys reading about USU in the newspapers and seeing how it has grown and all the research its students and faculty are doing.

"It is interesting to see the campus grow and see all the new buildings popping up because that's the reason I give – to help the university build itself up and offer more to its students and to the world. It can't grow without money, and it takes donations from a lot of people to make a difference."

Ross Peterson, USU's vice president for university advancement, agrees.

"The heart of donating at Utah State is the consistent annual gifts from alumni and friends that add up to make a big difference for individual departments and for students," Peterson says. "We appreciate their willingness to give back to help the university become a place where students can earn scholarships, work



Veibell's graduation photo from the 1947 USU yearbook, *The Buzzer*

with renowned professors and learn in state-of-the-art facilities.”

Veibell graduated with a degree in chemistry and worked for 41 years as the laboratory manager at Logan Regional Hospital until she retired in 1990.

In a 1986 newspaper article, *The Herald Journal* lauded her hard work in “‘Invisible’ Laboratory Technologists Honored.” When she first started her career, Veibell was the lone employee in the lab in the lab, the article read. Thirty-seven years later, she was responsible for a 33-member staff that performed an average of 60,000 tests each month. During her tenure at the lab, she guided the use of an increasingly technological approach to the painstaking work she once did by hand.

Before using her degree to manage the lab at the hospital, Veibell got her working experience at the Aggie Dairy where she was an “odds-n-ends girl.” She helped make cheese, cut butter into squares and wrapped it and, of course, made and served ice cream.

“We had this coffee ice cream in the store and nobody would buy it,” she says. “So one day, we decided to change the name to ‘Hawaiian Delight’ and we sold out in about 20 minutes. The chief wasn’t too happy, though, and told me if I ever tried that again, I was outta there.”

“PEOPLE NEED A LITTLE HELP
SOMETIMES, AND IF YOU CAN
HELP ONE PERSON, THEN
THEY CAN HELP SOMEBODY
ELSE, AND IT’S A GREAT
CYCLE.”

—MARIE VEIBELL, BS’47
CHEMISTRY

Veibell paid heed to his warning so she wouldn’t lose her high-paying job – 75 cents an hour, up from 50 cents an hour the year before.

After she graduated, Veibell stayed loyal to her alma mater. She continued to attend plays at the outdoor amphitheatre, see productions at the Caine Lyric Theatre, and her favorite – watch USU sports.

For her 80th birthday in 2005, Veibell’s family gave her a framed picture of the Hall of Fame basketball players from 1950-2005 that she proudly displays in her home.

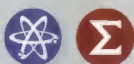
She remembers watching the Homecoming football game against Idaho State during Merlin Olsen’s senior year in 1961 when the Aggies won 69-0. The next day’s article in *The Herald Journal* makes it easy to see why this game stands out in the mind of an 83-year-old fan.

“The game featured a little bit of everything, from a slush-and-snow covered field to three senior linemen playing in the backfield,” it read. “The Aggies pushed for their first touchdown just five minutes into the game ... Aggie defensive tactics were so effective that during the first quarter the snow was not even disturbed on the north end of the field ... Tommy Larscheid’s performance made him the most productive ball carrier in history, as he eclipsed the record set by Jack Hill.”

A native of Cornish, Veibell has spent her life in Cache Valley and wants USU students to know how lucky they are to have a good place to go to school.

“You can get the same quality education, if not better, at Utah State as you can anywhere else,” she says. “It’s also got a great location – it’s clean, close to the mountains, and if you look around, there’s always something going on somewhere.”

—Annalisa Purser



USU Rhodes Scholar Marks

ACADEMIC MILESTONE

Aggie alum and Oxford graduate Lara Anderson explores particle physics, cosmology



At Oxford, USU Rhodes Scholar Lara Anderson wandered the same rose-bordered meadows and dusty passages that students have roamed for centuries. The university, she says, 'offers a kind of history that comes with an amazing sense of continuity.'

Reflecting on the past four years, Utah State University alum and Rhodes Scholar Lara Anderson '03, MS '04 says she's learned to appreciate what an international community can be and what a global viewpoint can accomplish. One of USU's most highly acclaimed scholars, Anderson, who earned degrees in physics and math from Utah State, graduated July 2008 from England's Oxford University with a doctorate in mathematical physics.

"As a theoretical physics student, my days at Oxford were taken up by research, teaching and studying," she says. "In the process, I lived and studied with people from literally everywhere and with nearly every possible ethnicity, philosophy, political creed and eclectic hobby. Being in the middle of such an extraordinarily varied, talented and just plain interesting group of people has been an incredible experience and one that I am definitely richer for."

Graduation day was filled with the pomp, circumstance and odd rituals one might expect from the institution that inspired Rowling's Harry Potter novels.

"Nearly the entire ceremony is conducted in Latin," Anderson says. "Academic gowns are worn all around – complete with bits of fur and fluff and great floppy hats, in which key officials hide their Latin crib notes."

Depending on the degree, some supplicants – as graduating students are called – get a ceremonial whack on the head with a book. Anderson says she was sorry to learn that the ritual didn't include recipients of doctoral degrees.

"But we did get a personal handshake from the head of the university," she says. "And my family was able to join me in Oxford for the ceremony. It was a great way to

celebrate and thank my parents and brother for all their love and support.”

Anderson, who was named a Goldwater Scholar and a Marshall Scholar during her Aggie years, recently started a postdoctoral position at the University of Pennsylvania. An investigator of String Theory, she’s using string theoretical techniques in an effort to provide new insight into particle physics and cosmology.

The new Philadelphia resident is also a visiting researcher at the Institute for Advanced Study in Princeton, N.J. She hops a train for the two-hour commute about three days a week.

“The institute is where Einstein worked,” she says. “It’s an excellent opportunity to work with some of the top minds in my field.”

Along with her peers, Anderson is excited about the advent of Europe’s Large Hadron Collider.

“The results of this experiment have the potential to truly revolutionize our understanding of fundamental physics,” she says. “I’m thrilled to be doing high energy physics at such an exciting time.”

In particular, Anderson says, scientists will be watching to see if LHC’s experiments reveal signs of

‘supersymmetry’ – that is, the idea that all particles seen in nature have yet-unseen partner particles at higher energy scales.

“Such findings will dramatically impact my field as whole as well as my own research,” she says.

As she puts her student days behind her and progresses to the next step of her career, Anderson says she’s thought a lot about her undergraduate years at Utah State.

“I’m deeply grateful for all the help and support that my physics

and math professors at USU gave me,” she says. “Their kindness, patience and endless enthusiasm for their subjects encouraged me to pursue the things that fascinated me most.”

—Mary-Ann Muffoletto



Anderson celebrated her recent graduation from Oxford with her family, from left, mother Sher, brother Luke, a senior mechanical engineering major at USU and father Andy, faculty member in USU’s Biology Department.





Douglas Lemon

"THE NATION FACES MANY CHALLENGES SUCH AS UNDERSTANDING CLIMATE CHANGE, DEVELOPING NEW SOURCES OF ENERGY, AND CONTINUING TO PROVIDE NATIONAL AND HOMELAND SECURITY. SDL CAN CONTRIBUTE SIGNIFICANTLY TO THE NEEDED SOLUTIONS..."

—DOUGLAS LEMON
DIRECTOR
SPACE DYNAMICS LABORATORY

Physics Alum Named Space Dynamics Lab Director

Douglas Lemon assumed
new post Oct. 20

The Utah State University Research Foundation announced Sept. 9 the appointment of Douglas Lemon as the Space Dynamics Laboratory's new director. He succeeds Mike Pavich, who is retiring after five years of dedicated service.

"The university is extremely pleased that Dr. Lemon has taken on the challenge of leading the Space Dynamics Laboratory in the midst of robust growth," said USU President Stan Albrecht. "Coupled with a deep affection for this university and the community, Dr. Lemon brings decades of scientific and technical vision which positions SDL to continue its impressive record of providing engineering solutions to

problems of national significance."

Lemon holds a bachelor's degree and Ph.D. in physics from USU and was awarded the university's coveted Robins Award in 1974. Lemon's career spans nearly 30 years in various roles at Washington's Pacific Northwest National Laboratory. Since 2007, he has acted as PNNL's director of Laboratory Strategy, responsible for creating an institutional strategy, identifying emerging trends and opportunities, and overseeing the laboratory's R&D initiatives.

Lemon also served as CEO of Advanced Geographic Information Systems, Inc., a PNNL technology spin-off company. As SDL looks into the future through its strategic plan, it aims to identify technologies

that have the potential of development into for-profit companies.

Lemon looks forward to returning to the valley and the challenges that await him at SDL.

"I am honored to be selected to lead SDL into its next period of growth and accomplishment," he said. "The nation faces many challenges such as understanding climate change, developing new sources of energy, and continuing to provide national and homeland security. SDL can contribute significantly to the needed solutions through its outstanding people and unique facilities. I am looking forward to returning to Cache Valley where I grew up and to Utah State University where my career in science and technology began."

For more information about the laboratory visit www.spacedynamics.org.

—Karen Wolfe
Space Dynamics Laboratory



USU alum Lars Peter Hansen, is the Homer J. Livingston Distinguished Service Professor at the University of Chicago.

Alum Lars Peter Hansen Wins National Math Award

Noted economist
receives 2008 CME
Group-MSRI
Prize

Utah State University alum Lars Peter Hansen is the recipient of a prestigious national award for economics research. Hansen, who serves as the Homer J. Livingston Distinguished Service Professor in the Department of Economics and Statistics at the University of Chicago, received the 2008 CME (Chicago Mercantile Exchange) Group-MSRI Prize in Innovative Quantitative Applications.

The annual prize recognizes mathematical or statistical contributions to the understanding of market behavior. Hansen received the prize medal, along with a \$25,000 cash award, in an Oct. 24 ceremony at the Chicago headquarters of CME Group, an international financial services company.

CME offers the honor in conjunction with the Mathematical Sciences Research Institute, a research center in Berkeley, Calif.

Leo Melamed, a member of the prize selection committee and former head of CME Group, said Hansen richly deserves the award, crediting him

with developing "one of the top statistical tools for the analysis of financial data."

"(His) decades of mathematical research have brought about significant advances in the world of financial economics," Melamed said.

Hansen is the son of renowned former USU academic vice president and biochemistry professor R. Gaurth Hansen and Anna Lou Rees Hansen. He earned a bachelor's degree in math from USU in 1974.

"My time at USU was very important to my development as a scholar," he said. "I remember well the influence of such faculty members as Mike Windham in mathematics, Bartell Jensen and Mike Lyons in economics and Doug Alder in history."

Hansen said that Windham's classes gave him "a great perspective on mathematics," while Jensen and Lyons prepared him to pursue graduate studies in a top economics program.

"Dr. Alder told me 'Do something special and don't just imitate others,'" he said.

Hansen completed a doctorate in economics from the University of Minnesota in 1978. In 1981, he joined the University of Chicago's economics and statistics department, where he excelled in the field of financial data testing and estimation.

"Probability theory and statistics provide wonderful tools to explore financial economics," Hansen said. "I expect they will continue to provide insights into the understanding of the economic underpinnings of financial markets just as they have served other scientific fields of endeavor."

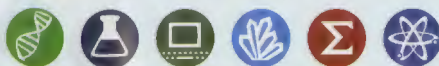
Hansen is a member of the National Academy of Sciences and American

**"MY TIME AT USU WAS
VERY IMPORTANT TO
MY DEVELOPMENT AS
A SCHOLAR. (HISTORY
PROFESSOR) DOUG ALDER
TOLD ME 'DO SOMETHING
SPECIAL AND DON'T JUST
IMITATE OTHERS.'"**

— LARS PETER HANSEN

Academy of Arts and Sciences, a fellow of the Econometric Society and a fellow of the American Finance Association. He is a former John Simon Guggenheim Memorial Foundation Fellow and Sloan Foundation Fellow. He is the recipient of the 2006 Erwin Plein Nemmers Prize in Economics from Northwestern University, a Faculty Award for Excellence in graduate teaching from the University of Chicago, and co-winner of the Frisch Medal from the Econometric Society.

—Mary-Ann Muffoletto



Fall '07 Valedictorian Amber Wilk, left, is joined by Dean Mary Hubbard and Wilk's faculty escort, Jim Cangelosi.

Amber Wilk **Valedictorian, Fall 2007**

From seventh grade on, Amber Wilk aspired to become a math teacher. Her choice was confirmed at Utah's Copper Hills High School, where her teacher for AP calculus was "amazing," she says.

"She assigned each of us the project of teaching a class and it was a great experience for me," recalls Wilk.

Born in North Carolina and raised in South Carolina, Wilk spent most of her high school years in Utah.

"I chose Utah State as my college destination because it offered a friendly campus away from home but not too far," she says.

Wilk majored in composite mathematics/statistics education and quickly immersed herself in study. Along the way, she discovered interests in statistics and geology in addition to her love of math.

For more than two years, Wilk worked with professor and faculty mentor Jim Cangelosi on the Utah Mathematics Endorsement Project. "This federally funded continuing education project helps teachers gain

their endorsement in mathematics," she says. "It was the best job I've ever had. I spoke with teachers all around the state who are in the mathematics classroom and gained so many new ideas."

Wilk had the opportunity to pursue her own teaching experience as a student teacher with eighth and

**"I'VE ESPECIALLY
APPRECIATED THE CLOSE
INTERACTION BETWEEN
STUDENTS AND FACULTY
IN THE COLLEGE OF
SCIENCE."**

**—RYAN CAMPBELL,
SPRING 2008
VALEDICTORIAN**

ninth grade students at South Cache Center. A challenge with young teens, she says, is bolstering their confidence and convincing them they can succeed at math.

Making the Grade, Making a Difference

**College of Science Scholars
Combine Academic Excellence with Service,
Campus Involvement**

As she looks to the future, Wilk is considering graduate study in biostatistics and public health.

"I'd like to travel and try living in a place I've never been before," she says.

Ryan Campbell **Valedictorian, Spring 2008**

Exploring ways to improve Cache Valley's air quality, along with the viewscapes of some of the West's celebrated national parks, has been a central focus of Ryan Campbell's undergraduate career.

A chemistry major with a Russian minor, Campbell combined his academic studies at USU with applied research in weather sensors at Campbell Scientific, Inc., a company founded by his uncles.

Working with mentors at USU and CSI, he developed a mathematical model to match the visibility readings of a CSI present-weather sensor with aerosol readings in Cache Valley. To pursue his project, Campbell studied research conducted by the federally funded Interagency Monitoring of Protected Visual Environments (IMPROVE) projects in national parks and



wilderness areas to understand the relationship between aerosol concentration and light extinction.

"I've always liked chemistry and math," Campbell says. "And I've especially appreciated the close interaction between students and faculty in the College of Science."

While at USU, the Cache Valley native found ways to integrate his passion for science, along with his love of music and the outdoors, with his interests in international affairs and business. The Phi Kappa Phi Fellow taught kayaking, guided tours in Grand Teton, Yellowstone and the Idaho wilderness, performed and recorded with the folk band, DAH, and participated in East European Student Union and Chemistry Club activities.

Campbell is the recipient of numerous academic awards, in-



Spring '08 Valedictorian Ryan Campbell, right, is joined by his faculty escort Stephen Bialkowski and Dean Hubbard.

cluding the Division of Analytical Chemistry American Chemical Society Award and the Harris O. and Eleanor Y. Van Orden Endowed Scholarship.

Beyond USU, Campbell plans to continue his employment with

CSI and explore graduate interdisciplinary graduate study in scientific instrumentation and business.

—Mary-Ann Muffoletto

Spring 2008 Honors

Scholar of the Year

Ashley Wilkinson, Biology

Honors Graduates

William Israelsen, Michael Whyte
Biology

Peak Prize Undergraduate Researcher of the Year

Arthur Mahoney
Computer Science

Undergraduate Teaching Fellow of the Year

Justin Peterson
Biology

Robins Award – Legacy of Utah State Award

Bradley Hintze
Chemistry and Biochemistry

Graduate Student (MS)

Researcher of the Year

Amanda Cangelosi
Mathematics and Statistics

Graduate Student (PhD)

Researcher of the Year

Robins Award –
USU Graduate Research
Assistant Award

Dmitry Zubarev
Chemistry and Biochemistry

Graduate Student Teacher of the Year

Nicole Davidson
Biology

USU Professional Employee of the Year

James Coburn, Physics

College of Science

Undergraduate Research Mentor of the Year

Alvan Hengge
Chemistry and Biochemistry

College of Science Faculty Researcher of the Year

James Powell
Mathematics and Statistics

College of Science Faculty Teacher of the Year

Keith Mott, Biology

College of Science Faculty Advisor of the Year

Robins Award – USU Faculty
Advisor of the Year

David Peak, Physics



Aggie Physicists Capture Space Freighter **'TAKING OUT THE TRASH'**

Mike Taylor, Jonathan Snively board NASA jet
to record re-entry images

IN A BRILLIANT RAINBOW of color, the European Space Agency's Jules Verne Automated Transfer Vehicle burst through the Earth's atmosphere Sept. 29 and disintegrated – along with tons of waste picked up from the International Space Station.

"That's exactly what it was designed to do," says Utah State University physics professor Mike Taylor who, along with USU postdoctoral researcher Jonathan Snively, was among an international team of scientists aboard a NASA jet studying the disposable spacecraft's dramatic re-entry.

Taylor and Snively departed NASA's Dryden Flight Research Center in California Sept. 26 and headed to Tahiti to prepare for the unmanned space freighter's return to Earth's atmosphere. The Aggie physicists were tapped to capture video of the spacecraft as it plunged from orbit over a deserted swath of the South Pacific.

Aboard a NASA DC-8 observation plane, Taylor and Snively mounted five different types of video cameras to record data of the tour bus-sized ATV as it zoomed along a precisely calculated path and splintered into pieces.

"It was much brighter and more colorful than we expected," Snively says. "We're typically looking at natural phenomena – meteors in the Earth's atmosphere. To see something large and manmade was a very interesting opportunity."

The pair collected nearly 30 hours of data that they'll be analyzing over the next year.

"Studying the spacecraft's re-entry and how it reacted reveals valuable information about the behavior of and emissions from falling satellites – both manmade and natural," Taylor says.

In 2006, Taylor photographed the re-entry of NASA's Stardust capsule, which "acted like a giant meteor," he says.

"We recorded carbon emissions from that craft – something no one else has seen," Taylor says.

Named for the famed French science fiction writer, the Jules Verne, the first of Europe's ATVs, was launched from French Guiana March 9. It successfully docked with the ISS about a month later, delivering tons of essential food, water, propellant and equipment. A welcome visitor, it corrected the space station's drifting orbit and even helped the flying lab dodge passing space junk. Upon leaving, it took out the station's trash.

Taylor and Snively's flight was not so flawless. "We battled 160-mph head winds, so our pilots had a hard time keeping the NASA plane on a course to enable us to capture images of the ATV," Taylor says.

The pair also recounted the challenge of mounting cameras in flight, getting ready to record data and dismantling and stowing equipment before landing – all in a



◀ Video still of the European Space Agency's Jules Verne Automated Transfer Vehicle as it returned from its space mission Sept. 29. USU physicists Mike Taylor and Jonathan Snively, with colleague Antoine Banvandi of ESA, captured the image from a NASA observation jet.

confined space with multiple teams of scientists.

"Nothing could be mounted until after takeoff, such we had to work quickly and carefully to protect sensitive equipment and avoid any mishaps during turbulence," Taylor says. "We had quite a spaghetti bowl of cables and were worried stiff about something getting disconnected. But everything worked and we're delighted with the results so far."

The Jules Verne represents an important milestone for the ESA and future ATV missions.

—Mary-Ann Muffoletto



Taylor, left, and Snively aboard a NASA DC-8 observation plane. Using five different types of video cameras, the physicists, with colleague Antoine Banvandi of ESA, recorded data from the Jules Verne spacecraft's dramatic re-entry.

UtahState
UNIVERSITY

college of science



Visit the College of Science's updated Web site at www.usu.edu/science.

College of Science Unveils Updated Web Site

Visit us at www.usu.edu/science

At the start of fall semester the College of Science launched a new Web site at www.usu.edu/science. Sporting an updated design and new photos, the site is intended to serve as a gathering place for information and ideas. The home page of the new site features a calendar and recent news about the college.

One of the goals of the new site is to provide a central location where students, alumni, faculty and staff can conveniently access news and information about what's happening in the college. We invite you to bookmark the site and visit us often.



USU's 2008 Goldwater Scholars. (left to right) Jodie Barker-Tvedtnes (scholarship recipient), Sydney Chamberlin (honorable mention), Cody Tramp (honorable mention) and Tamara Jeppson (scholarship recipient).

College of Science Home to 'Golden Scholars'

Two students named
Goldwater Scholars,
two receive honorable
mention

SCIENCE STUDENTS Tamara Jeppson and Jodie Barker-Tvedtnes were named 2008 Goldwater Scholars by the Barry M. Goldwater Scholarship and Excellence in Education Foundation. Aggie scientists Sydney Chamberlin and Cody Tramp were awarded honorable mentions in the prestigious competition.

"For the first time in the university's history, all of the candidates we submitted were accepted for awards," said Joyce Kinkead, USU associate vice president for research. "We're very proud of these outstanding students."

In addition to this year's award recipients, Utah State boasts nine Goldwater Scholars and two honorable mention recipients from previous years. The scholar award includes a two-year scholarship of up to \$7,500 per year.

"This is a testament to the fantastic research mentorship provided to these students by faculty at USU," said Mary S. Hubbard, dean of USU's College of Science. "These

awards confirm that our students are prepared to compete with the best nationwide. I applaud the accomplishments of these young scholars."

Jeppson, a graduate of Bear River High School in Garland, Utah, is majoring in geology and physics. With faculty mentor Jim Evans, she is studying how earthquake energy is partitioned along the San Andreas Fault.

Jeppson completed a summer internship in applied geophysics at the Pacific Northwest National Laboratory in 2007. Following graduation from USU, she plans to pursue a doctorate in geophysics, conduct research and teach at the university level.

Salt Lake City native Barker-Tvedtnes was named a Goldwater Honorable Mention recipient in 2007. She is pursuing a bachelor's degree in physics with a minor in classics.

In summer 2007, Barker-Tvedtnes attended the Polar Astronomy Radio Science Summer School in Alaska, where she conducted

research on noctilucent clouds with faculty mentor Mike Taylor. She received a 2008 Outstanding Student Award for Undergraduate Research from the National Society of Physics Students and traveled to the International Conference of Physics Students in Cracow, Poland in August 2008 to present her research.

Barker-Tvedtnes plans to continue her studies at the graduate level and conduct research in upper atmospheric physics at a government or academic institution.

Chamberlin, a physics, mathematics and political science major from South Jordan, Utah, achieved the rank of cadet colonel in the Civil Air Patrol. She received the patrol's highest honor, the General Carl A. Spaatz Award, in 2007.

While at USU, Chamberlin earned a scholarship for summer study at Germany's Friedrich Schiller University. She plans to pursue a doctorate in mathematical physics and an academic career.

Lander, Wyo., native Cody Tramp is a third year student major-



ing in molecular biology and biochemistry. The USU Undergraduate Research Fellow is pursuing four ongoing research projects. He was named a 2008 Governor's Scholar by Gov. Jon Huntsman, Jr.

Tramp's goals include earning a doctorate in both molecular and cellular biology. He plans to conduct research in stem cell biology and work in a national research laboratory.

USU's 2008 honorees are among 321 award recipients selected from a field of 1,035 math, science and engineering students nominated by colleges and universities nationwide.

Previous Aggie honorees are Jennifer Albretsen Roth, physics, Arthur Mahoney, computer science and Barker-Tvedtnes (Honorable Mention), physics, in 2007; Logan McKenna, electrical engineering; Heidi Wheelwright, physics; and Keith Warnick (Honorable Mention), physics, in 2006; Stephanie J. Chambers, biology and David Hatch, physics, in 2004; Jamie B. Jorgensen, physics, in 2002; Lara B. Anderson, physics, in 2001 and Jeff Jacobs, mechanical engineering, in 1998.

The Goldwater Scholar program was established by Congress in 1986 to foster academic excellence in science, engineering and mathematics in the nation's universities.

—Mary-Ann Muffoletto

Student Chem/ Biochem Club Receives National Recognition

Aggie chemists lauded for outreach efforts to K-12 students



Chem/Biochem Club member Natasha Haslam, left, demonstrates an experiment to youngsters at USU's recent Celebration of Children and Families event.

USU'S CHEMISTRY & BIOCHEMISTRY CLUB, a student affiliate chapter of the American Chemical Society, was among 40 student chapters nationwide selected by the society for an Outstanding Chapter Award for the 2007-08 academic year.

The USU group was chosen from more than 330 student chapters. The Aggies will be recognized in an awards ceremony during the society's annual national meeting this spring in Salt Lake City.

"Formation of an officially recognized ACS chapter is an achievement in and of itself," says Steve Scheiner, head of USU's Chemistry and Biochemistry Department. "To receive an Outstanding Chapter Award is a wonderful testament to efforts and commitment of these students and their faculty mentors, Scott Ensign and Lisa Berreau."

The ACS lauded the USU chapter's community service outreach efforts.

Referring to the club's coordination of the university-wide "Going Green Extravaganza" Earth Day celebration held April 2008 on the USU Quad, selection committee members wrote, "(coordinating) a 4500-person extravaganza was an awesome achievement. Great job."

In addition, the committee applauded the chapter's outreach programs to youngsters. During the 2007-08 academic year, the club presented chemistry demonstrations at elementary schools throughout Cache Valley and beyond, as well as to preschool and scout groups. The club also presented at USU celebrations, including Aggie Family Day and the Community Children's Halloween Carnival.

Club members served as judges for a science fair held at InTech Collegiate High School, a charter school emphasizing math and science on USU's Innovation Campus. The members have also mentored high school students during on-campus lab field trips and during a summer high school internship program hosted by the Department of Chemistry and Biochemistry.

"Our student chapter is raising the level of understanding of chemistry throughout our community," Scheiner says.

"USU is setting a fine example for other chapters and preparing the next generation of chemical professionals," says Bruce Bursten, ACS president.

—Mary-Ann Muffoletto



USU PHYSICS DAY

to Celebrate 20th Anniversary

Planning in progress for May 15, 2009 extravaganza
at Lagoon amusement park

IN WHAT HAS BECOME a spring rite of passage for hosts of Intermountain teens, some 7,000 budding scientists are expected to descend on Davis County's Lagoon amusement park for USU Physics Day Friday, May 15, 2009. Celebrating its 20th anniversary, the day-long extravaganza features hands-on learning, academic competition and fun. In the course of the day, middle and high school science students from Utah and

surrounding states will transform northern Utah's überplayground into a giant laboratory to explore such basic physics concepts as gravity, projectile motion and centrifugal force.

"What better laboratory to entice young people than an amusement park?" says J.R. Dennison, USU physics professor and a founding organizer of the annual event.

Teens will use accelerometers they've built themselves to measure G-forces on the Colossus roller coaster, bomb a giant target with raw eggs in self-designed protective containers from the Sky Coaster, display ideas for thrilling rides of the future and compete in the Physics Bowl academic competition. At the same time, they'll have the opportunity to earn money for college. Last year the day's top six academic competitors received four-year scholarship offers to Utah State. Prizes donated from sponsors – totaling more than \$75,000 – were distributed.

Dennison estimates that by the conclusion of the 20th anniversary some 100,000 teens will have participated in the action-packed event. Special plans are already in the works, he says, to celebrate 2009's landmark anniversary.

"Physics Day offers teens the opportunity to bring their world together with science," says Dean Mary Hubbard. "By making this connection students are inspired to think about careers in science."

Initiated by USU's Department of Physics in 1989, Physics Day is coordinated by USU and partners Idaho National Laboratory, Lagoon and the Rocky Mountain NASA Space Grant Consortium. Additional sponsors include ATK Thiokol Launch Systems, Boeing, Eastern Idaho Regional Medical Center, Hill Air Force Base, IM Flash, Micron, MOOG, NASA Idaho Space Grant Consortium, North Wind, S&S Worldwide, U.S. Navy, USU College of Science and USU Admissions.

*Read more at
<http://physicsday.usu.edu>.*

◀ At the conclusion of the 20th Anniversary Physics Day in May 2009, an estimated 100,000 budding scientists will have participated in the day-long extravaganza.

Are YOU a Physics Day Alum?

In preparation for this coming spring's 20th anniversary celebration of USU Physics Day, the College of Science would like to hear from past participants. To share your memories of Physics Day, contact college writer Mary-Ann Muffoletto at maryann.muffoletto@usu.edu.





Professor Richard Cutler is the new head of USU's Department of Mathematics and Statistics.

Richard Cutler Named Mathematics & Statistics Department Head

Mathematician-turned-statistician sees
bright future for USU department

UTAH STATE UNIVERSITY'S Richard Cutler once thought of himself as a pure mathematician. Borrowing a quote from the legendary Mae West, he says, "I used to be as pure as the driven snow, then I drifted."

The temptation? The irresistible lure of graduate study in statistics at the University of California-Berkeley. Cutler's change of academic direction yielded a number of benefits including deepened respect and appreciation for both theoretical and applied disciplines of math and statistics. It's a foundation that serves him well as he steps in as head of USU's Department of Mathematics and Statistics.

"I'm very comfortable in a joint department," says Cutler, who assumed his new responsibilities June 1.

Kenyan-born Cutler spent his formative years in New Zealand, completed undergraduate studies at the University of Auckland and earned master's and doc-

toral degrees from UC-Berkeley before joining USU in 1988. As department head, he succeeds Professor Russell Thompson, who has served in the position since 2000.

Cutler notes that university programs embracing both theoretical and applied branches of math and stats are somewhat unusual.

"Many statisticians think of themselves as information scientists and some schools have separate departments where statisticians are grouped with disciplines other than math," he says. "But USU's mathematics and statistics department has a broad, inclusive approach that offers diverse and stimulating learning opportunities."

In addition to offerings in statistics and theoretical, applied and computational mathematics, USU offers a robust program in mathematics education.

"We're not only training first-time teachers," Cutler says. "We're offering educational programs to enable current teachers to earn math certification as well as recruiting second-career professionals for training as math teachers."

Cutler's aims for the department also include bolstering graduate and research programs.

"We offer a rich environment of applied research with very few boundaries," he says. "Our researchers work with scientists in varied disciplines throughout the university."

Cutler himself pursues diverse research projects with colleagues in USU's Center for Epidemiological Studies along with ecological studies of threatened and invasive species.

All disciplines depend on statisticians to make sense of burgeoning data sets in all kinds of fields, he says. "Statistics is relevant throughout scientific research as well as in industry."

Regarding student recruitment, Cutler concedes that math and stats could benefit from an image makeover.

"Many find mathematics and statistics boring or intimidating," he says. "But these disciplines offer a huge variety of exciting study and career opportunities."

Exploring the causes of hip fractures – an increasingly serious epidemic among the nation's growing elderly population – facial birth defects, autism; predicting the dispersal of invasive species and the spread of destructive mountain pine beetles; unlocking the mysteries of the Earth's upper atmosphere, forecasting currency exchange rates, exploring genomics and cryptography. These and more, Cutler says, are among the many exciting applied projects faculty in the Department of Mathematics and Statistics are currently pursuing.

—Mary-Ann Muffoletto



USU alum Laura Swift, center, accepts a Smart Women Grant check from Scott Anderson, left, president and CEO of Zions Bank, and Cece Mitchell, manager, Zions Bank Women's Financial Group.

Physics Alum Awarded Zions Bank Grant to Boost Science Outreach

Laura Swift plans planetarium tour for Cache Valley students

USU GRADUATE LAURA SWIFT thinks a trip to the planetarium should be within everyone's reach – and she's on a personal mission to see that residents of Cache Valley can enjoy learning about the wonders of the night sky without a lengthy trip.

Swift, who earned a bachelor's degree in physics teaching from USU in 2004, is the recipient of a 2008 Zions Bank Smart Women micro-grant. She received a \$2,647 award in an Oct. 16 ceremony at the bank's Salt Lake City headquarters in response to her proposal to upgrade USU's existing StarLab portable planetarium and use it for presentations throughout the community.

"Utah has several planetariums including Salt Lake City's Clark Planetarium – one of the nation's best," says Swift. "But getting there is a hardship for many Cache Valley residents and the distance makes it too costly and time-consuming for many local schools to arrange as a field trip."

Swift learned that USU's Junior Engineering program owned a portable planetarium but the unit needed upgrades along with the manpower to conduct presentations using it.

"We're delighted that Laura is interested in helping us and will make good use of the StarLab," says Neil Dabb, program coordinator for Junior Engineering.

A portion of Swift's grant will purchase a new projection cylinder for the portable dome, which is inflated with an electric blower and accommodates about 25 children at a time. The remainder of the grant will provide support toward a student intern and advertising of the program.

Starting in January 2009, Swift plans to donate her time for evening presentations at local schools.

"USU, WITH SPACE DYNAMICS LABORATORY, IS ONE OF THE WORLD'S PREMIER SPACE RESEARCH UNIVERSITIES. SO, IT MAKES SENSE FOR LOGAN TO HAVE A PLANETARIUM — TO SHARE THE EXCITEMENT OF SPACE WITH THE COMMUNITY'S YOUNG PEOPLE."

—PHYSICS ALUM LAURA SWIFT

"USU, with Space Dynamics Laboratory, is one of the world's premier space research universities," says Swift, who earned a master's degree from France's International Space University. "So, it makes sense for Logan to have a planetarium – to share the excitement of space with the community's young people."

—Mary-Ann Muffoletto



Honoring TRADITION Securing Our FUTURE

The Campaign for Utah State University

THANK YOU FOR THE FINANCIAL SUPPORT

you have shared with the College of Science this year. We continue to make progress toward reaching our campaign goal of \$10 million. The funds you share with the College of Science are critical to our efforts to provide our students access to a college education and the opportunity to learn from our talented and dedicated faculty.

A number of the students highlighted in this issue of *Insights* have benefited from endowed funds supporting scholarships and research experiences. I hope you share our sense of celebration at their accomplishments.

Endowments supporting scholarships, research and faculty teaching truly transform lives in perpetuity, and we are grateful for individuals who have established a legacy of supporting academic success and achievement at Utah State. The majority of the endowments in the College of Science have been established by people who know us best – our faculty.

We invite Science alumni to join our faculty and other generous alumni in supporting the College of Sci-

Thank you for your SUPPORT

ence through an annual gift or by establishing an endowment. Your support, in combination with the dedication and hard work put forth by our students and faculty, results in transformational outcomes.

I encourage you to use our secure giving link at <https://www.usu.edu/campaign/giving> to make an annual gift to the College of Science this year. Please contact me if you have questions about establishing an endowment.

Thank you for the support you share with the College of Science at Utah State University.

Chris Tallackson

College of Science Development Director

chris.tallackson@usu.edu

435-797-3510



Homecoming Spirit: Physicists at Work

AS PART OF A LONG-STANDING Aggie tradition, College of Science student clubs joined with groups across campus to "Paint the Town Blue" during October's Homecoming Week. USU's chapter of the Society of Physics Students "did it up right" with an inventive, humorous creation. Their street painting design on 700 East in the heart of campus depicted "Physicists at Work" with the mathematical expression that is the technical definition of 'work' in physics.

The Aggie physicists' creation was featured on the national Society of Physics Students Web site as the "Image of the Month" for October 2008.



Aggie physicists, from left, Dan Burton, Merissa Himle, Jake Knight, Robert Call, Ethan Lindstrom, Tom Apedaile, Tamara Jeppson, Eve Fowles and Megan Lindstrom, combine work with play.

college of science

0305 Old Main Hill
Logan, Utah 84322-0305 USA
435.797.2478
scido@usu.edu
www.usu.edu/science

DEPARTMENT OF BIOLOGY

435.797.2485
www.biology.usu.edu

**DEPARTMENT OF CHEMISTRY AND
BIOCHEMISTRY**

435.797.1619
www.chem.usu.edu

DEPARTMENT OF COMPUTER SCIENCE

435.797.2451
www.cs.usu.edu

DEPARTMENT OF GEOLOGY

435.797.1273
www.usu.edu/geo

**DEPARTMENT OF MATHEMATICS
AND STATISTICS**

435.797.2809
www.math.usu.edu

DEPARTMENT OF PHYSICS

435.797.2857
www.physics.usu.edu



Professor Susanne Janecke

Promotions

Susanne Janecke, professor, Geology
Vladimir Kulyukin, associate professor,
Computer Science

Xiaojun Qi, associate professor, Computer Science
Linda DuHadway, senior lecturer, Computer Science
John Flores, senior lecturer, Biology

New Faculty

Daniel Bryce, assistant professor, Computer Science
Renee Bryce, assistant professor, Computer Science
Nathan Geer, assistant professor,
Mathematics and Statistics
Shane Larson, assistant professor, Physics
Nghiem Nguyen, assistant professor,
Mathematics and Statistics

In Memoriam

USU alum and emeritus professor of physics John Karl Wood passed away May 16, 2008, in Logan at the age of 88. Wood graduated from Utah State Agricultural College with bachelor's and master's degrees in 1941 and 1943, respectively, and subsequently earned his doctorate degree from Pennsylvania State University. He joined USU's faculty as department head of the Physics Department in 1956 and remained with the department until his retirement in 1975. Over the course of his distinguished career, Wood taught during USU's post-war student boom and rebuilt USU's machine shop. With Nobel Prize-winning physicist Kai Siegbahn, Wood developed an X-ray spectrometer that measured energy levels of electrons. He was preceded in death by his wife, Margaret, to whom he was married for 60 years. Wood is survived by his children James, Robert, Donald and Elizabeth and their spouses, nine grandchildren and nine great-grandchildren, as well as his siblings Stephen, Patricia and Maxine.



1970s

Mike Simpson (BS 2002), Blackfoot, Idaho/Washington, DC. Rep.



Simpson (R-Idaho), who is serving his fifth term in the U.S. House of Representatives for Idaho's Second Congressional District, was awarded honorary membership in the Academy of General Dentistry July 30, 2008. Simpson, who earned a DDS degree from Washington University School of Dental Medicine in 1979 and has been a general dentist in private practice for more than 20 years, was cited for his efforts in sponsoring legislation advancing the importance of preventive oral health care. Simpson left USU in the 1970s before graduating to enter dental school. He was awarded a bachelor's

degree from Utah State during spring commencement in 2002. Simpson is married to USU alum Kathy Simpson, his wife of 36 years. Also of note: Simpson was named to Esquire magazine's 2008 list of the "Top 10 Most Principled and Committed Members of the U.S. Congress."

2000s

Suzanne Copeland Baker (BS 2001, Physics), Jacksonville, Florida. In her seventh year of teaching Physics Honors and Advanced Placement at Edward H. White High School in the Duval County School District, Baker was named Teacher of the Year 2007-08. This past year, she mentored a student robotics team that placed fifth in regional competition. Baker sponsors

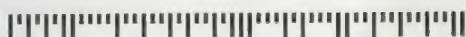
a Junior Civitan community service chapter with 120 student members. She was named Outstanding Faculty Advisor of the Year with Junior Civitan International and also received a Civitan International Foundation Junior Fellow Award. In addition, Baker serves as assistant coach for her school's cross country and track team. She and fellow coaches won Women's Team Second Place Overall in the 2008 Gate River Run 15K Championship. Baker is married to USU alum Chris Baker '02 and they have a four-year-old daughter, Ellie.



We welcome news from College of Science alumni.

Please contact editor

Mary-Ann Muffoletto at maryann.muffoletto@usu.edu
or 435-797-3517.



COLLEGE OF SCIENCE
0305 OLD MAIN HILL
UTAH STATE UNIVERSITY
LOGAN UT 84321-9981

POSTAGE WILL BE PAID BY ADDRESSEE

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 115
LOGAN UT

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



FROM

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. Simply clip this page from the magazine, fold on the dotted line, tape shut and drop it in the mail. You can also email information to maryann.muffoletto@usu.edu or fax us at 435.797.3378.

Name _____

Mailing Address/City/State/Zip _____

Home Phone () _____ Work Phone () _____

Email Address _____ Web Page URL _____

USU Degree(s), Year(s), Major(s) _____ Year(s) _____ Major(s) _____

Other Degrees, Year(s), Major(s) _____ Year(s) _____ School(s) _____

Profession/Employer _____

Professional/Personal Awards _____

Books Published _____

About Yourself _____

UtahStateUniversity

College of Science
Office of the Dean
0305 Old Main Hill
Logan, UT 84322-0305

NONPROFIT ORG.
U.S. POSTAGE
PAID
UTAH STATE
UNIVERSITY

1592

REBECAH SKEEN
1367 N 220 W APT 2
LOGAN UT 84341-6825

