

October 2009 to December 2009

To share the research and professional development activities of our faculty and students with the College, Utah State Administrators, and the Board of Trustees.

—The Dean’s Corner—

Dear Friends:

As many of you know, Mary Hubbard has moved upward in the university hierarchy and is currently Vice Provost for Global Engagement. All of us in the college wish her well. I am honored to be back as dean of the college again. Last time I was dean, it was for 11 years starting in 1989. Boy, have things changed. We have many new, bright, hard-working faculty that I am just getting to know. Of course, there are many old friends that I worked with previously and they are helping to make my transition back to the deanship an easy one. The physical facilities on campus and at Innovation Campus have blossomed. The President has presided over a fundraising campaign that is the most successful in the school’s history, thanks to the support of many of you reading this note. Our successes are too numerous to recount.

All of this has occurred despite the fact that the college has dwindled in number of faculty and increased in number of students over the last several years. Statewide budget cuts and the national economy, in general, have altered the way we do our jobs. But neither the excellence of our faculty nor their dedication to provide knowledge and skills to our students has diminished. In fact, in these difficult times our faculty and staff have stepped up and taken on additional tasks so we can continue to offer a wonderful learning environment for our students.

All in all, we are doing well and continue to achieve our academic goals both personally and with and for our students. A measure of our faculty’s success includes

- David Peak, who was named Utah’s 2009 Carnegie Professor of the Year
- Alex Boldyrev, who received the 2009 D. Wynne Thorne Career Research Award and the Utah Award in Chemistry.
- Farrell Edwards and the team that developed the National Library of Virtual Manipulatives, including Larry Cannon and Bob Heal, who received the 2009 Governor’s Medal for Science and Technology.

These mentions merely scratch the surface. Our faculty members continue to win acclaim and to distinguish themselves in research, teaching, and service.

I’d like to take this opportunity to thank each of you for your dedication, perseverance, and hard work. It’s an honor and pleasure to serve with you and – with you on the team – I’m optimistic and excited about the college’s future.



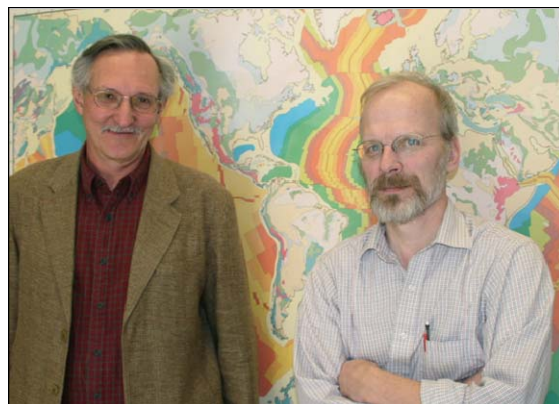
— College of Science Contract & Grant Activity —

\$ Amounts (# of proposals)	October 2009	November 2009	December 2009	Cumulative Totals FY09-10
Proposals Submitted	\$7,418,653 (14)	\$3,632,394 (10)	\$4,997,244 (18)	\$59,327,407 (99)
Awards Received	\$898,123 (10)	\$59,083 (2)	\$712,728 (3)	\$5,179,445 (42)

— Where the Heat Is: USU Geologists Receive \$4.9M in Stimulus Funding —

The College of Science is leading the way in a federally funded \$4.6 million-dollar geothermal drilling project that will create dozens of jobs and student research opportunities while simultaneously fueling energy development and deciphering the Snake River Plain's volcanic history. A separate \$300,000 project will advance carbon capture and storage technologies while providing innovative student training opportunities.

John Shervais, professor and head of USU's Department of Geology, is project director for the recently announced "*Snake River Geothermal Drilling Project — Innovative Approaches to Geothermal Exploration*," one of 123 projects awarded Recovery Act funding by the U.S. Department of Energy. The USU-led venture is one of 24 selected "Innovative Exploration and Drilling Projects" focused on the development of new geothermal fields using innovative sensing, exploration and well-drilling technologies. "The project creates extraordinary hands-on learning projects for students and paves the way for larger, continuing geothermal research projects for USU," Shervais says.



Geology professors John Shervais, left, and Jim Evans recently received \$4.9 million in Recovery Act funding to lead geothermal energy and carbon sequestration projects.

Geology professor Jim Evans is co-investigator on the two-year project, which started Jan. 1, 2010, and includes collaborators from Boise State University, Canada's University of Alberta, Southern Methodist University, the U.S. Geological Survey and the International Continental Drilling Program based in Potsdam, Germany. The two-phase project begins with surface mapping and surveys of two south central Idaho drilling sites, one in the town of Kimberly, about five miles east of Twin Falls, and the other at Kimama in rural Lincoln County.

Drilling of the mile-deep boreholes, expected to commence March 2010, will be carried out around the clock for approximately three to six months by the Salt Lake City-based DOSECC (Drilling, Observation and Sampling of the Earth's Continental Crust) consortium with additional support from the ICDP. "The experience of being on the drilling site and analyzing samples as they're extracted will enable students to build a unique skill set," Evans says. "It's unusual for undergraduates to be exposed to this kind of on-site learning opportunity."

Investigators will penetrate earthen crust in excess of 212 degrees Fahrenheit, Shervais says. "Idaho is ranked third among western states for geothermal power production by the Geothermal Task Force of the Western Governors Association," he says. "The group estimates that Idaho has 855 megawatts of near-term potential power production." Geothermal energy is an ideal complement to solar and wind energy, each of which provides intermittent sources of power, Shervais says. "Geothermal energy provides continuous power and can be supplemented by solar and wind power during times of peak usage," he says. "And geothermal energy produces no emissions, no wastewater and it's renewable."

In a separate project funded by the DOE's National Energy Technology Laboratory, Evans received a \$300,000 carbon capture and storage research grant. During the four-year project, which also began Jan. 1, Evans and students will examine naturally occurring carbon dioxide-charged systems in southeastern Utah to determine characteristics required for engineered CCS systems.

—Mary-Ann Muffoletto

For complete story visit <http://www.usu.edu/ust/index.cfm?article=40402>

— Keep in Touch on the Web —

Everyone is encouraged to bookmark and visit the College of Science web site, www.usu.edu/science, frequently for news and information updates, as well as the college's Facebook page, "USU College of Science."



— Three CoS Professors Receive 2009 Governor’s Medal for Science and Technology —



Physics professor Farrell Edwards and mathematics professors Larry Cannon and Bob Heal are among the 2009 recipients of the Governor’s Medal for Science and Technology, the State of Utah’s top science prize. In a Jan. 5 ceremony in Salt Lake City, Gov. Gary Herbert and State Science Advisor Tami Goetz presented the awards to Edwards and to Cannon and Heal, who, along with USU colleagues Jim Dorward and Joel Duffin, are members of the team that developed the National Library of Virtual Manipulatives.

Both medals were presented in the science education category of the annual program, which began in 1987.

Edwards was lauded for his teaching efforts and his involvement in the formation of USU’s Space Dynamics Lab and the recently established USU Energy Dynamics Laboratory. The NLVM team was praised for its creation of one of the world’s most widely used math education software programs for elementary and secondary school students.

— Mary-Ann Muffoletto



NLVM Team, from left, Larry Cannon, Bob Heal, Joel Duffin and Jim Dorward.

To read the complete story online, visit <http://www.usu.edu/science/>

— VPR Seed Grants Selected for Funding January 1, 2010 —

Research Catalyst (RC)

- Dr. Bradley Davidson (PI), Assoc. Prof., Chemistry & Biochemistry, “Exploring Microbial Resources for New Anticancer Cyclopamine Analogs” \$20,000.
- Dr. Kady Schneiter (PI), Asst. Prof., and Brynja Kohler, Asst. Prof., Mathematics & Statistics “Collaborative Development of Integrated Technology Lessons for Statistics” \$20,000.

Seed Program To Advance Research Collaboration (SPARC)

- Dr. Alvan Hengge (PI) Chemistry & Biochemistry, Sean Johnson, Chemistry & Biochemistry, “New Antibacterial Approaches: Targeting the OspF Family of Virulence Factors” \$34,943.

Information on the seed grants programs is available at: http://research.usu.edu/htm/grants_funding

Spring 2010 Deadline: Submit applications to the College of Science Dean’s Office no later than **22 March 2010**.

Questions? Contact Lisa M. Berreau at 797-3509 or lisa.berreau@usu.edu.

— Intercontinental Synergy: USU, Chinese Chemists Receive NSF Funding —

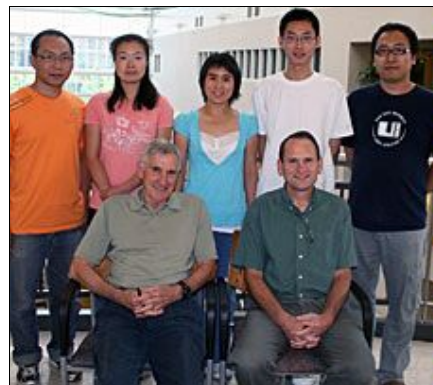
Nearly two decades ago, chemistry professor Vernon Parker welcomed Professor Jin-Pei Cheng of China's Nankai University as a visiting professor in Parker's USU research group. In the ensuing years, a partnership has grown between the two schools that includes cooperative research and a collaborative graduate program supported by the National Science Foundation.

Parker received a \$667,000 NSF grant to fund his proposal, "International Collaboration in Chemistry." At the same time, the project received about \$150,000 in funding from the Chinese National Science Foundation to support Parker's researcher partners at Nankai.

"Our research project challenges long-accepted dogma about detailed mechanisms of fundamental organic reactions," says Parker. "The preliminary results of our work have fueled controversy. By collaborating in two different laboratories on two different continents, we hope to explore these new ideas and gain acceptance of the new concepts."

Parker, Cheng and their research team assert that certain organic reactions are more complex than previously thought and they've developed kinetic tools to demonstrate their findings. The pair's collaborative graduate program currently supports five Nankai students who are pursuing doctoral and postdoctoral research at USU.

— Mary-Ann Muffoletto



Seated, from left, are Chemistry and Biochemistry Department professors Vernon Parker and Lance Seefeldt and standing, from left, are Nankai/USU students Zhiyong Yang, Yuan Chu, Weifang Hao, Jia Wang and Zhao Li.

To read the complete story online, visit <http://www.usu.edu/ust/index.cfm?article=39459>

— Four Science Students Receive Fall '09 URCO Grants —

The following College of Science students are recipients of Undergraduate Research and Creative Opportunities (URCO) grants for fall 2009:

Name	Department	Faculty Mentor	Project Title
Tim Holmes	Computer Science	Daniel Bryce	The Symbolic Context-enhanced Additive Heuristic for Domain Independent Classical Planning
Scott Jensen	Physics	Timothy Doyle	Experimental Studies of New Nanoparticle Technologies for Medicine
Brooks Marshall	Chemistry & Biochemistry	Lisa Berreau	Synthesis and Characterization of CO-releasing Ruthenium Complexes
Megi Rexhepaj	Chemistry & Biochemistry	Sean Johnson	Biochemical and Biological Analysis of the Mtr4 Arch Domain by Site Directed Mutagenesis

For more information about URCO grants, visit: <http://research.usu.edu/undergrad/htm/funding-opportunities/urco>

— Chang and Doyle Receive USTAR Tech Commercialization Grants —

Two projects in the USU College of Science are among five Utah State University programs that received Technology Commercialization Grants through the Utah Science Technology and Research "USTAR" Initiative. The grants are funded by the American Recovery and Reinvestment Act. Cheng-Wei Tom Chang, associate professor of organic chemistry and Tim Doyle, research associate professor in physics, were among five USU researchers selected from 16 submitters in the first round of USTAR TCG funding:

Chang's project, "Efficacy Study of New Antibiotics," will use the USTAR funds for scale-up synthesis of NEOF004, a novel synthetic aminoglycoside-derived antibiotic. NEOF004 has been shown to be effective against Gram-positive organisms in-vitro and is highly effective against Methicillin-resistant *Staphylococcus Aureus* (MRSA) and Vancomycin-resistant *Enterococci* (VRE) in-vitro.

Doyle is developing "Radiation Detection and Localization Systems," a radiation detection, identification and localization technology suitable for control radioisotopes, including strategic nuclear materials.



USTAR launched the TCG program in August 2009 to advance innovative technologies to market from Utah's public colleges and universities. Upcoming grant proposal submission periods are Dec. 31, March 30 and June 30.

For more information, visit <http://economicdevelopment.usu.edu/htm/t-c-grants>

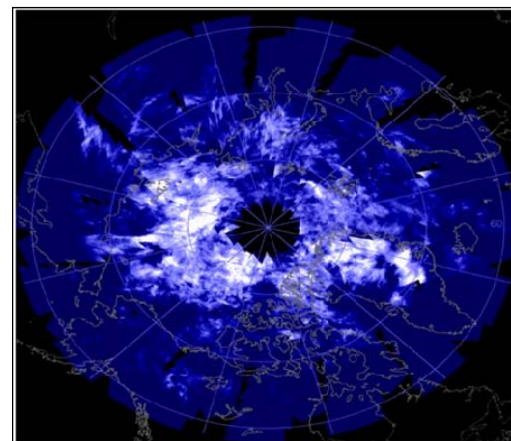
— USU Physics Research Contributing to NASA Polar Clouds Mission —

Physics professor Mike Taylor is a member of NASA's science team for the Aeronomy of Ice in the Mesosphere or "AIM" mission, which launched an unmanned spacecraft into orbit April 25, 2007. USU's Space Dynamics Laboratory designed and built one of the instruments flying on the satellite that is collecting information about how and why noctilucent clouds, also called polar mesospheric clouds or "PMCs," form.

According to a Dec. 2009 report in *National Geographic News*, these night-shining clouds, once seen mostly in the Arctic, are now appearing more frequently at lower latitudes. Based on five polar seasons of data, the satellite has revealed that the clouds' seasonal appearances turn on and off as abruptly as a "geophysical light bulb," according to the AIM Web site.

Taylor is currently studying the clouds from a research site at the South Pole. A number of his undergraduate and graduate students are involved in analyzing cloud data collected from field sites in Alaska and Canada, along with data collected from the satellite.

—Mary-Ann Muffoletto



This image of Polar Mesospheric Clouds (PMC) was captured from the AIM satellite's Cloud Imaging and Particle Size instrument on July 14, 2009 in the northern polar region. Courtesy of NASA.

<https://www.usu.edu/science/index.cfm?usu-research-contributes-to-nasas-polar-clouds-mission>

— STUDENT ACTIVITIES —

Student Awards, Recognition & Grants

undergraduate* graduate**

Biology

Joseph S. Wilson**

Theodore Roosevelt Memorial Grant, American Museum of Natural History
\$1,000

"Biodiversity and Endemism in Velvet Ants (Hymenoptera: Mutillidae) of the Madrean Sky Islands."

Geology

Kelly K. Bradbury** received a \$1,500 Structural Diagenesis scholarship award from GDL Foundation for her proposed research on "Chemical and Physical Processes in Sedimentary Sequences Near the San Andreas Fault." Faculty mentor: **James P. Evans**.

Kelly K. Bradbury** received a \$2,000 scholarship from the Society of Exploration Geophysicists for continuing analyses of borehole geophysics data and combining these data with geologic observations from SAFOD. Faculty mentors: **James P. Evans** and **Anthony Lowry**.

Kelly K. Bradbury** received a \$3,800 scholarship from the Society of Petrophysicists and Well Log Analysts to support continuing sample analyses of exhumed faults related to geological studies associated with the SAFOD borehole and geophysical data. Faculty mentor: **James P. Evans**.

Physics

Alec Sim** received a NASA Rocky Mountain Space Grant Consortium Graduate Fellowship.

Charlie Sim* received a USU Undergraduate Research and Creative Opportunities (URCO) Award, "Evaluation of the Temperature Dependence of Endurance Models of Electrostatic Breakdown," (\$500, February 2009 to September 2009). Faculty mentor: **J. R. Dennison**.

Student Presentations

undergraduate* graduate**

Biology

Aaron M. Duffy** presented "Simulating Fern Lifecycles and Population Genetics in a 3-Dimensional Virtual World" at the Annual Meeting of the Botanical Society of America, Snowbird, UT, 25-20 July 2009.

Glenda M. Yenni** presented "Coexistence Patterns in a Desert Rodent Community" at the annual meeting of the American Society of Mammalogists, Fairbanks, AK, 24-28 June 2009.

Almut H. Vollmer**, **Nabil N. Youssef**, and **Daryll B. DeWald** presented a poster titled "NaCl Stimulates Primary Root Elongation in the *Arabidopsis* Mutant *sac9*" at the 26th Annual Interdisciplinary Plant Symposium: Root Biology, University of Missouri, Columbia, MO, 27-29 May 2009.

Almut H. Vollmer**, **Nabil N. Youssef**, and **Daryll B. DeWald** presented a poster titled "Characterization of *sac9*, a Phosphoinositide Phosphatase Mutant of *Arabidopsis thaliana* Involved in Phospholipid Signaling; Early Development and Ultrastructure of Primary Roots" at Plant Biology 2009: Joint Annual Meetings of the American Society of Plant Biologists (ASPB) and the Phycological Society of America (PSA), Hawaii Convention Center, Honolulu, HI, 18-22 July 2009.

Geology

Skye W. Cooley**, **Margaret McMillan**, and **Chris R. Tressler**** presented a talk titled "GIS Methods for Tectonic Geomorphology" at the annual meeting of the Geological Society of America, Portland, OR, 18-21 October 2009.

Physics

Scott C. Jensen* and **Timothy E. Doyle** presented a poster titled "Nanoparticle Interactions with Low-Frequency Electromagnetic Fields for Ablation Therapy" at nanoUtah 2009, Salt Lake City, UT, 15-16 October 2009. Scott Jensen won first prize in the Nanomedicine category for his presentation of this work.

Scott C. Jensen* and **Timothy E. Doyle** presented a poster titled "Nanoparticle Interactions with Low-Frequency Electromagnetic Fields for Ablation Therapy" at the American Physical Society Four Corner Section Meeting, Golden, CO, 22-23 October 2009.

Alec Sim** and **J. R. Dennison** presented a poster titled "Charge Dynamics in Disordered Insulating Materials" at the American Physical Society Four Corner Section Meeting, Colorado School of Mines, Golden, CO, 23-24 October 2009. The presentation received an award as the Outstanding Graduate Poster Presentation.

Richard Wilson** and **D. Mark Riffe** presented a poster titled "Vibrational Structure of the Alkali Metal Surfaces" at the American Physical Society Four Corner Section Meeting, Colorado School of Mines, Golden, CO, 23-24 October 2009. The presentation received an award as the Outstanding Graduate Paper.

Jonathan Pugmire*, **Michael Taylor**, **Kim Nielsen****, **Allen Wall**, **Jonathan Thompson***, and **Dominique Pautet** presented a poster titled "Intra-Annual Comparison of Mesospheric Gravity Waves Over Halley and Rothera Stations, Antarctica" at the American Physical Society Four Corner Section Meeting, Colorado School of Mines, Golden, CO, 23-24 October 2009. The presentation received an award as the Outstanding Undergraduate Poster Presentation.

Justin Koeln* of the USU GAS team was chosen as one of five finalists for the 17th Annual Frank J. Redd Student Scholarship Competition at the 23rd Annual AIAA/USU Conference on Small Satellites in Logan, UT, 11-14 August 2009. Justin was the only undergraduate researcher chosen for this in the last decade.

Justin P. Koeln* (with Heng Ban and **J. R. Dennison**) presented a poster titled “Thin Wire Nucleate Boiling of Water in Sustained Microgravity” at the Proceedings of the 23rd Annual AIAA/USU Conference on Small Satellites, Logan, UT, 11-14 August 2009. The presentation was selected as a finalist for presentation at the 17th Annual Frank J. Redd Student Scholarship Competition.

Student Publications

undergraduate* graduate**

Biology

Jonathan B. Koch** and Jamie P. Strange. 2009. Constructing a Species Database and Historic Range Maps for North American Bumblebees (*Bombus sensu stricto* Latreille) to Inform Conservation Decisions. *Uludag Bee Journal* 9:97-108.

Physics

Jennifer A. Roth*, **Ryan Hoffmann****, **J. R. Dennison**, and Jonathan R. Tippetts, “Effects of Radiation Induced Conductivity on Electrostatic Discharge in Insulating Materials,” Paper Number: AIAA-2009-3527, *Proceedings of the 1st AIAA Atmospheric and Space Environments Conference*, 2009.

— FACULTY ACTIVITIES —

Awards & Recognition

undergraduate* graduate**

Biology

The research of **Dr. Susannah French** is highlighted in the 25 August web edition of *ScienceNews*. See news item “Leptin Leads to Hamster Baby Boom” by Jenny Lauren Lee at: http://www.sciencenews.org/view/generic/id/46707/title/Leptin_leads_to_hamster_baby_boom.

Dr. Joseph Li, organizer of the 12th SCBA International Symposium, was awarded the SCBA Life-Time Service Achievement Award, 15-16 July, Taipei, Taiwan.

Dr. Kimberly Sullivan has been named President-elect of the Cooper Ornithological Society.

Physics

Timothy Doyle has been selected as a co-chair for nanoUtah 2010. This is a Utah-based nanotechnology conference held yearly.

Faculty Grants

undergraduate* graduate**

Biology

Timothy A. Gilbertson

National Institutes of Health – National Institute for Diabetes, Digestive and Kidney Diseases (NIH-NIDDK)
1 September 2009 to 31 August 2011 - \$694,349
“Mechanisms of Peripheral Fat Detection”

Michelle A. Baker

Central Davis Sewer District
June 2009 to December 2009 - \$31,089
“Nutrient Limitation of Algae in the Jordan River”

Daryll B. DeWald

Echelon Biosciences – National Institutes of Health (NIH)
July 2008 to June 2010 - \$30,000
“IP3R Antagonists”

Daryll B. DeWald

Harvey Mudd College – National Science Foundation (NSF)
June 2009 to December 2009 (renewed January 2010) - \$30,000
“SAC9, A Novel, Plant-Specific Phosphoinositide Essential for Membrane/Cytoskeleton Dynamics in *Arabidopsis*”

Donald W. Roberts

APHIS/USDA,
1 January to 31 December 2009 - \$80,810
“Analyzing USA Soil Samples for Pathogens of Insects” (Especially Mormon Crickets and Grasshoppers)

Jennifer Reeve, Brent Black, **Diane Alston**, Corey Ransom, Ruby Ward, and Silvana Martini
USDA CSREES OAREI
1 September 2009 to 31 August 2013 - \$637,519
“Organic Stone Fruit Production: Optimizing Water Use, Fertility, Pest Management, Fruit Quality and Economics”

Timothy A. Gilbertson

International Flavors & Fragrances
1 October 2009 to 30 September 2010 - \$146,865
“Fat Perception in Taste Cells”

Chemistry & Biochemistry

Alvan Hengge

National Institutes of Health
30 September 2009 to 31 August 2011 - \$612,216
“Mechanisms of Phosphoryl Transfer”

Physics

Timothy E. Doyle

USU/USTAR Technology Commercialization Grant
4 January 2010 to 31 December 2010 – \$23,923
“Radiation Detection and Localization Simulations”

J. R. Dennison

Subcontract for NASA / SBIR Phase II Grant by Ashwin-Ushas Corporation

September 2009 to December 2009 - \$16,639

“Spacecraft Charging and Electrostatic Materials Testing for Ashwin Electrochromic Materials” (Subcontract)

“Development of Electrochromic Materials for Spacecraft Thermal Control” (SBIR Grant)

Faculty Presentations & Professional Activities

undergraduate* graduate**

Biology

Jacob B. Davidson* and **Paul G. Wolf** presented “Breeding System of *Primula maguirei*: A Threatened, Cliff-Dwelling, Narrow Endemic” at the Annual Meeting of the Botanical Society of America, Snowbird, UT, 25-29 July 2009.

Jacob B. Davidson* and **Paul G. Wolf** presented “Breeding System Characterization of a Threatened, Cliff Dwelling, Narrow Endemic *Primula*” at the Southwest Rare Plant Conference, Salt Lake City, UT, 19 March 2009.

Sarah Mohlman** and **Morgan Ernest** presented “Rodent Seed Predators Fail to Impact Plant Species-Area-Relationships (SARs) at Portal LTREB” at the annual meeting for the American Society of Mammalogists, Fairbanks, AK, 24-28 June 2009.

Sarah Mohlman** and **Morgan Ernest** presented “Predator Influences on Prey Community Structure in a Long-Term Experimental Rodent-Plant System” at the annual meeting for the Ecological Society of America, Albuquerque, NM, 2-7 August 2009.

Lori R. Spears and **James A. MacMahon** presented a poster titled “Effects of Insect Availability and Shrub Architecture on Spider Abundance and Diversity: An Experimental Study of Spiders in a Shrub-Steppe Ecosystem” at the Ecological Society of America annual meeting, Albuquerque, NM, 2-7 August 2009.

Joshua P. Der** and **Paul G. Wolf** made a presentation titled “Exploratory Analyses of Genomic Sequences in the Bracken Fern, *Pteridium aquilinum*” at the Botany and Mycology Conference, Snowbird, UT, 25-29 July 2009.

Joshua P. Der**, John A. Thomson, **Jeran K. Stratford***, and **Paul G. Wolf** presented a poster titled “Global Chloroplast Phylogeny and Biogeography of Bracken (*Pteridium*: Dennstaedtiaceae)” at the Botany and Mycology Conference, Snowbird, UT, 25-29 July 2009.

David Clark*, **Christopher Peterson***, **Uyen Lam***, Tina Yu Hu, Changyuen Dong, and **Joseph Li** presented a poster titled “Molecular and Mechanistic Insights into Bluetongue Virus Oncolysis of Human Cancer Cells: A Potential Candidate of Virotherapy for Human Cancer” at the 12th SCBA International Symposium, Taipei, Taiwan, 15 July 2009.

Joseph Li, **Christopher Peterson***, **Uyen Lam***, David Clark, Jun Hu, and Changyuen Dong presented a poster titled “Apoptosis Profiles and Insights into the Oncolytic Bluetongue Virus: A New Player for the Selective Lysis of and Viratherapeutics for Human Cancer Cells” at the 10th International Symposium on Double-Stranded Viruses, Hamilton Island, Australia, 21-25 June 2009.

Carol von Dohlen presented a plenary lecture titled “Aphid Molecular Systematics: History, Progress and Prospects” at the Eighth International Symposium on Aphids in Catania, Sicily, 9-13 June 2009.

The following papers and posters were presented at the annual meeting of The Society for Invertebrate Pathology, Park City, UT, 16-20 August 2009:

Everton K. K. Fernandes, **Chad A. Keyser***, **Drauzio E. N. Rangel****, Nelson R. Foster, and **Donald W. Roberts**. “A Selective Medium for Isolating Entomopathogenic Fungi *Metarhizium* and *Beauveria* from Western United States Soil.” Oral Presentation.

Chad A. Keyser*, **Everton K. K. Fernandes**, Stefan T. Jaronski, and **Donald W. Roberts**. “Heat-induced Post-stress Growth Delay: A Biological Trait of Many *Metarhizium* Isolates that May Reduce Field Efficacy.” Oral Presentation.

Drauzio E. N. Rangel**, **Everton K. K. Fernandes**, Helen G. Bignayan, Hernani G. Golez, and **Donald W. Roberts**. “Conidial Mass Production of Entomopathogenic Fungi and Tolerance of Mass-produced Conidia to UV-B Radiation and Heat.” Poster.

Erika Nascimento, Everaldo Marques, Ludmilla Tonani, **Donald W. Roberts**, and **Gilberto U. Braga**. “Conidial Pigmentation Protects DNA from UV-B Induced Damage in the Entomopathogenic Fungus *Metarhizium anisopliae*.” Poster.

Rodrigo B. Ferreira, **Everton K. K. Fernandes**, **Chad A. Keyser***, Scott Treat, and **Donald W. Roberts**. “Biology of Mormon Cricket *Anabrus simplex* and Laboratory Colony Development.” Poster.

The following papers were presented at the Joint Meeting of Ichthyologists and Herpetologists in Portland, OR, 22-27 July 2009:

Edmund D. Brodie, Jr. “Introduction: Robert M. Storm Symposium.” This was a symposium honoring Dr. Storm (Dr. Brodie’s major professor) on his 91st birthday.

Chris Feldman**, **Edmund D. Brodie, Jr.**, Edmund D. Brodie III, and **Michael Pfrender**. “Evolutionary Genetics of Tetrodotoxin (TTX) Resistance in Snakes.”

Charles Hanifin**. “Of Channels and Coevolution: Tetrodotoxin (TTX) Toxicity in the Salamandridae.”

Dan Foley**, Jennifer Sunderland, and Gary Garrett. “Diet of an Invasive Suckermouth Catfish (*Hypostomus* sp.) and Examination of Possible Dietary Overlap with Indigenous Fishes in San Felipe Creek, Texas.”

Daniel Mulcahy**, Tyler Williams, **Joseph Mendeldson III**, and Jack Sites. “Phylogenetic Relationships among Mesoamerican Bufonids.”

Megan Lahti**. “Morphological Variation of Dwarfed Populations of Short-horned Lizards (*Phrynosoma hernandesi*) and Great Plains Toads (*Anaxyrus cognatus*) in the San Luis Valley, Colorado.”

Brian Gall** and Alicia Mathis. “Innate Predator Recognition in Larval Hellbenders (*Cryptobranchus alleganiensis*) and the Problem of Introduced Trout.”

Kristin Bakkegard**. “Genetics of Colonization in *Ambystoma gracile* after the 1980 Eruption of Mount St. Helens.”

Amber Stokes**. “Sex-biased Predation on Taricha by a Novel Predator in Annadel State Park.”

The following papers were presented at the Association for Chemoreception Sciences XXXIst Annual Meeting, Sarasota, FL, 22-26 April 2009:

Pin Liu**, **Bhavik P. Shah****, **Hala Hadawar**** and **Timothy A. Gilbertson**. “Fatty Acids Induce Increases in Intracellular Calcium in Type II and a Subset of Type III Mouse Taste Cells.”

Bhavik P. Shah**, **Pin Liu****, **Tian Yu****, **Dane R. Hansen** and **Timothy A. Gilbertson**. “Direct Evidence of the Role of TRPM5 in Bitter Transduction in Enteroendocrine Cells.”

Arian F. Baquero**, **Stephanie Croasdell**** and **Timothy A. Gilbertson**. “Pathophysiological Role of ENaC in a Mammalian Model of Diabetes.”

Han Xu**, Jason Montez, Stephen Gravina, Mark Dewis, **Tian Yu****, **Bhavik P. Shah****, and **Timothy A. Gilbertson**. “Functional Characterization of Two Fatty Acid Activated GPCRs Expressed in the Mammalian Gustatory System.”

Tian Yu**, **Bhavik P. Shah****, **Pin Liu****, and **Timothy A. Gilbertson**. “Fatty Acid Transduction in Chemosensory Cells” [symposium presentation].

Timothy A. Gilbertson. “Making Sense of Fat Taste” [symposium presentation].

Edward W. Evans presented “Dynamics and Impact of *Coccinella septempunctata* as an Invasive Lady Beetle in North America” at the International Organization of Biological Control Conference on Benefits and Risks Associated with Exotic Biological Control, Engelberg, Switzerland, 6-9 September 2009.

Edward W. Evans presented “Rarity Confronted with Invasion: Fate of *Coccinella novemnotata* Following the Establishment of Exotic Lady Beetles in the Intermountain West (North America)” at the First International Entomophagous Insects Conference, Minneapolis, MN, 28-31 July 2009.

Timothy A. Gilbertson presented a plenary lecture titled “Insulin Regulates the Function of Epithelial Sodium Channels and Salt Taste Preference” at the 7th International Symposium on Molecular & Neural Mechanisms of Taste and Olfactory Perception in Fukuoka, Japan, 3-4 November 2009. Co-author on the presentation was **Arian F. Baquero**.

Chemistry & Biochemistry

Lisa M. Berreau presented a seminar titled “Synthetic and Mechanistic Investigations of CO-releasing Divalent Nickel Acireductone Complexes” at the:

Institute of Catalysis and Surface Chemistry, Polish Academy of Science, Krakow, Poland, 7 October 2009.

Silesian University of Technology, Gliwice, Poland, 8 October 2009.

University of Utah, Salt Lake City, UT, 27 October 2009.

University of Wisconsin-Eau Claire, Eau Claire, WI, 30 October 2009.

Lisa M. Berreau chaired the NIH F04A Graduate Fellowship Panel (Chemical and Bioanalytical Sciences) in Washington, D.C. 15 October 2009. With this meeting, Dr. Berreau completed two years of service as chair (2008-2009, 3 meetings/year).

Scott Ensign presented the opening “John Ingraham Plenary Lecture” at the West Coast Bacterial Physiologists Meeting, Asilomar, CA, 11 December 2009.

Joan Hevel presented an invited lecture titled “The Methylation of Protein Arginyl Groups by PRMT1: How Much Control is Exerted by Substrate Sequence?” at Georgia State University, Atlanta, GA, 20 November 2009.

Geology

Sessions convened and chaired at the annual meeting of the Geological Society of America, Portland, OR, 18-21 October 2009:

The Franciscan Assemblage and Tectonostratigraphic Terranes of the Western United States I and II: A Tribute to M.C. Blake Jr. (GSA Structural Geology and Tectonics Division; GSA Cordilleran Section; Friends of the Franciscan). **John W. Shervais** and **A. S. Jayko**, presiding.

Large Igenous Provinces (LIPS) through Geologic Time (GSA Geoinformatics Division; GSA Structural Geology and Tectonics Division; GSA International Division). **A. Krishna Smith**, **Barry B. Hanan** and **John W. Shervais**, presiding.

Alluvial Records: Numerical Data and Archives of Climatic, Environmental, and Neotectonic Change. **Tammy M. Rittenour**, invited speaker and presiding.

The following papers were presented at the annual meeting of the Geological Society of America, Portland, OR, 18-21 October 2009:

Joel L. Pederson, Erin Tainer, Gary O'Brien, and Tammy M. Rittenour.** "Geoarchaeology Along the Colorado River in Grand Canyon—Culturally Rich Alluvial Stratigraphy and the Issue of Paleofloods Versus Changing Grade in a Bedrock Canyon."

J. L. Pierce, G. A. Meyer, and Tammy M. Rittenour. "Terrace Records of Holocene Incision, Aggradation, and Relationships Between Hillslope Erosion and Main Channel Processes in Central Idaho."

M. K. Kenworthy*, J. L. Pierce, Tammy M. Rittenour, and K. L. Pierce. "Climate, Sediment Supply, and Stream Power: Episodes of Enhanced Deposition on Alluvial Fans of the Lost River Range, Idaho."

M. J. Bartholomew, M. J. Bone, Tammy M. Rittenour, A. M. Mickelson, and M. C. Stickney. "Stress Switching? Along the Lime Reservoir Fault in Yellowstone's Wake."

Thomas E. Lachmar. "Fracture-Flow Hydrogeology of the Bunker Hill Mine, Kellogg, Idaho OR What I Did at the University of Idaho."

Jonathan E. Harvey, Joel L. Pederson, and Tammy M. Rittenour.** "Influence of Arroyo Cycles on Downstream Paleoflood Records - An Example from Buckskin Wash, UT/AZ."

John W. Shervais, Scott K. Vetter, and Barry B. Hanan. "The Snake River Plain Large Igneous Province (SRP-LIP) Through Time."

John W. Shervais, Sung Hi Choi, and Warren D. Sharp. "Tehama-Colusa Serpentinite Melange - Franciscan, Coast Range Ophiolite or Both?"

Barry B. Hanan, A. Krishna Sinha, and John W. Shervais. "Does the Central Atlantic Magmatic Province (CAMP) Represent a Plume Induced Lithosphere Melting?"

Michael L. Cline and Tammy Rittenour. "Luminescence and AMS Radiocarbon Dating of Middle-Late Holocene Slackwater Flood Deposits in the Dolores Watershed, CO."

W. David Liddell and John W. Shervais. "Applied Geosciences in the Modern Geology Curriculum."

Bonnie L. Pitblado and Carol M. Dehler. "Fingerprinting Archaeological and Geologic Quartzite Samples Using ICP-MS Techniques."

Kelly K. Bradbury and James P. Evans.** "Franciscan Formation Within the SAFOD Borehole, Near Parkfield, CA."

Carol M. Dehler, C. Mark Fanning, and Paul Karl Link. "Getting Better with Age: New U-PB Shrimp Data from the 'Sturtian' Scout Mountain Diamictite-Cap-Carbonate Sequence, Pocatello FM, Idaho."

Katherine J. Meixell, Chad Wittkop, Tammy M. Rittenour, and Kyle A. Makovsky. "Holocene Stream Capture of the LeSueur River, Minnesota: Implications for Modern Sediment Loading."

The following posters were presented at the annual meeting of the Geological Society of America, Portland, OR, 18-21 October 2009:

Tammy M. Rittenour and Heidi R. Pearce*. "Drought and Dune Activity in the Idaho Falls Dune Field, Snake River Plain, Southeastern Idaho."

Tammy M. Rittenour and Anne Hayden*. "Arroyo Cycles in the Upper Escalante River Drainage, Southern Utah: Utilizing OSL Dating to Extend Regional Fluvial Chronologies."

The following papers were presented at the annual meeting of the American Geophysical Union, San Francisco, CA, 13-18 December 2009:

John W. Shervais and R. V. Metcalf. "Supra-subduction Zone (SSZ) Ophiolites; The Fore-arc Connection." (Invited)

A. Krishna Sinha, Barry B. Hanan and John W. Shervais. "An Integrated Geochemical and Isotopic Model for Late Proterozoic to Recent Super-Continent Dispersal Associated with Large Igneous Provinces (LIPS) of Eastern North America."

James P. Evans, Tamara N. Jeppson, Kelly K. Bradbury and Anthony R. Lowry. "Evaluation of Fault Zone Structure and Properties at Depth with Insights Into Deformation and Alteration of the San Andreas Fault at SAFOD."

Kelly K. Bradbury, James P. Evans, Tamara N. Jeppson, and Anthony R. Lowry. "Material Properties of Franciscan Melange and Fault Rock Lithologies at SAFOD: Implications for Fault Zone Processes Along the Central Creeping Segment of the San Andreas Fault."

Christopher Tressler and Joel L. Pederson presented a poster titled "Colorado Plateau Rock Strength, Exhumation, and River Knickzones – Spatial Datasets Relating Erodability to Topographic Metrics."

Henry Berglund, Anne Sheehan, R. Steve Nerem, James Choe, **Anthony R. Lowry**, Mousumi Roy, Fred Blume, and Mark Murray presented a poster titled "Rio Grande Rift GPS Measurements 2006-2009."

Kelly K. Bradbury, James P. Evans, Tamara N. Jeppson, and **Anthony R. Lowry.** “Material Properties of Franciscan Mélange and Fault Rock Lithologies at SAFOD: Implications for Fault Zone Processes Along the Central Creeping Segment of the San Andreas Fault.”

James P. Evans, Tamara N. Jeppson, Kelly K. Bradbury, and **Anthony R. Lowry.** “Evaluation of Fault Zone Structure and Properties at Depth, with Insights into Deformation and Alteration of the San Andreas Fault at SAFOD.”

Anthony R. Lowry. “A Pair of Puzzles in EarthScope TA-Derived Crustal Structure.”

Marta Pérez-Gussinyé, Marianne Metois, Manel Fernández, Jaume Vergés, Javier Fulla, and **Anthony R. Lowry.** “Effective Elastic Thickness of Africa and Its Relationship to Other Proxies for Lithospheric Structure and Surface Tectonics.”

John Puchakayala, C. P. Rajendran, and **Anthony R. Lowry.** “Andaman Post-Seismic Deformation Observations: An Update.”

Derek Schutt, Saswata Hier-Majumder, **Anthony R. Lowry,** and Yinjie Yang. “Investigating the Physical State of the Western U.S. Upper Mantle Using a Multi-Disciplinary Approach.” (Invited)

Tammy M. Rittenour chaired a session at the New World Luminescence Dating Workshop, Seattle, WA, 22-23 October 2009. Luminescence Applications and Methodology. The following papers were presented:

Tammy M. Rittenour. “Application of a Modified Single-Grain Quartz SAR Protocol to Date Xenoliths Within Basalt Flows from a Young Cinder Cone, Northern Arizona, USA.”

Michelle Summa* and **Tammy M. Rittenour.** “The First Application of Optically Stimulated Luminescence Dating and Age Model Comparison to Kanab Creek Alluvial Deposits, Southern Utah.”

Anne Hayden* and **Tammy M. Rittenour.** “Arroyo Cycles in the Upper Escalante River Drainage, Southern Utah: Utilizing OSL Dating to Extend Regional Fluvial Chronologies.”

M.K. Kenworthy* and **Tammy M. Rittenour.** “OSL Chronology for Alluvial Fan Deposition in the Lost River Range, Idaho.”

David Forand*, James P. Evans, and **Susanne U. Janecke** presented the poster titled “Structural Analysis of the Cajon Pass Core and Implications for Fault Structure and Processes” at the Annual Meeting of SCEC, Palm Springs, CA, 13-16 September 2009.

Mathematics and Statistics

David E Brown hosted “Combi-Notorious,” a workshop on Discrete Mathematics for Utah middle and high school teachers sponsored by the Park City Math Institute and the Institute for Advanced Study, 14 November 2009.

John R. Stevens presented a poster titled “Statistical and Numerical Dependence in Gene Expression Summaries” at the Joint Statistical Meetings held in Washington D.C., August 2009.

John R. Stevens presented a talk titled “Statistical Issues in the Normalization of Multi-Species Microarray Data” at BYU Statistics Department Seminar, October 2009. (Invited)

John R. Stevens presented a lecture titled “Statistical Issues in the Normalization of Multi-Species Microarray Data” at a BYU-Idaho Mathematics Department Seminar, November 2009.

Mevin B. Hooten, J. Anderson, and L. Waller presented a talk titled “Assessing Continental Influenza Dynamics with Statistical Agent-based Models” at the GEOMED conference on geomedical systems held in Charleston, SC, 14-16 November 2009. (Invited)

Ephraim M. Hanks, Mevin B. Hooten,** and D. S. Johnson presented a poster titled “Agent-based Inference for Animal Movement and Selection” at the SAMSI workshop on space-time analysis for environmental mapping, epidemiology, and climate change held in the Research Triangle, NC, 13-16 September 2009. (Invited)

Dariusz M. Wilczynski presented a talk titled “Quaternionic Toric Manifolds” at the Bratislava Topology Symposium “Group Actions and Homogeneous Spaces” held in Bratislava, Slovakia, 7-11 September 2009.

Physics

Timothy E. Doyle, Vern Hart, and Brady Ambrose*** presented a paper titled “Simulation of Ultrasonic Scattering in Breast Tissue Based on Cell and Tissue Morphology” at the 158th Meeting of the Acoustical Society of America, San Antonio, TX, 26-30 October 2009.

Three students from the **USU Get-Away-Special (GAS) Team*** led by **Jan Sojka** and **J.R. Dennison** attended the 14th Rocky Mountain NASA Space Grant Consortium NASA Fellowship Symposium in Salt Lake City, UT on May 4 2009. **J. R. Dennison** chaired a student session and participated in the meeting of the Board of Trustees. Presentations included:

Kyle Hodgson* with **J. R. Dennison.** “Space Research Projects for the International Space Station.”

Justin Koeln* with **Jan Sojka** and **J. R. Dennison.** “Microgravity Experiments for the ISS.”

Troy Muro* with **J. R. Dennison.** “Photoelectric Charging by Ultraviolet Light of a Lunar Dust Simulant in a Microgravity Environment.”

Jennifer A. Roth* and **J. R. Dennison** attended the 1st AIAA Atmospheric and Space Environments Conference in San Antonio, TX on June 22-25, 2009. **J. R. Dennison** chaired the session on Space Environment Effects. Presentations included:

Jennifer A. Roth*, **Ryan Hoffmann****, and **J. R. Dennison**. “Effects of Radiation Induced Conductivity on Electrostatic Discharge in Insulating Materials.”

J. R. Dennison, **Joshua L. Hodges****, **J. Duce***, and **Amberly Evans***. “Flight Experiments on the Effects of Contamination on Electron Emission of Materials.”

Robert Call*, **Justin Dekany***, **J. R. Dennison**, **Amberly Evans***, **Scott Jensen***, **Jonathan Pugmire***, **Mark Riffe**, **Alec Sim****, **Charles Sim***, **Andy Spencer***, **Jaimy Tomlinson***, and **Richard Wilson**** attended the American Physical Society Texas/Four Corner Section Meeting at University of Texas–El Paso in El Paso, TX on 19-20 October 2009. **Mark Riffe** chaired a session on Materials Physics. The following three oral presentations were made:

Jaimy Tomlinson*, **Mike Taylor** and Mathew Deland. “An Investigation of Polar Mesospheric Clouds Using Satellite and Ground-based Measurements.”

Richard Wilson** and **D. Mark Riffe**. “Vibrational Structure of the Alkali Metal Surfaces.”

D. Mark Riffe. “Trends in Core-level Shifts at Bimetallic Interfaces Formed by Group-10 Metals Deposited on W (110).”

Research posters presented:

Robert Call* and Trevor Wiley. “Synchrotron Studies on Copper-Phthalocyanine.”

Andy Spencer**, **Eric Held** and Jeong-Young Ji. “Novel Numerical Solution to the Plasma Kinetic Equation.”

Justin Dekany*, **J.R. Dennison**, and **Alec Sim****, “Reduction and Characterization of Error in Low Current Measurements.”

Charles Sim* and **J.R. Dennison**. “Temperature Dependence of the Electrostatic Breakdown of Polymeric Materials.”

Amberly Evans* and **J. R. Dennison**. “The Effects of Surface Contamination and Roughening on Diffuse Optical Reflection and Photoyields on Spacecraft Materials.”

Justin P. Koeln* (with Heng Ban and **J. R. Dennison**) presented “Thin Wire Nucleate Boiling of Water in Sustained Microgravity” at the 23rd Annual AIAA/USU Conference on Small Satellites, Logan, UT, 11-14 August 2009.

J. R. Dennison presented an invited poster titled “Testing of Materials Electrical Properties and Radiation Effects at Utah State University” at the Radiation Capabilities for the Europa Jupiter System Missions Instrument Workshop, Johns Hopkins Applied Physics Laboratory, Laurel, MD, July 2009.

The Center for Atmospheric & Space Sciences

Bela G. Fejer presented a tutorial paper titled “Low Latitude Ionospheric Electrodynamics” at the International Living with a Star Meeting held in Sao Paulo, Brazil, 4-9 October 2009.

The following papers were presented at the Fall American Geophysical Meeting held in San Francisco, CA, 14-18 December 2009:

Bela G. Fejer. “Empirical Models of Equatorial Storm-Time Electric Fields.”

H. Luhr, M. Rother, **Bela G. Fejer**, K. Haeusler, P. Alken. “Tidal Signatures in Thermospheric and Ionospheric Quantities.”

Robert W. Schunk. “Ion and Neutral Outflows in the Polar Cap and Auroral Oval.” (Invited)

Robert W. Schunk, **Ludger Scherliess**, **Jan J. Sojka**, **Donald C. Thompson**, and **Lie Zhu**. “Operational Space Weather Models: Trials, Tribulations and Rewards.”

Jan J. Sojka. “The IPY Ionosphere: An Extreme Solar Minimum?” (Invited)

Jan J. Sojka. “Non-Equatorial Ionospheric Gradients.” (Invited)

W. Kent Tobiska, **Robert W. Schunk**, **Jan J. Sojka**, **Donald C. Thompson**, **Ludger Scherliess**, **L. Zhu**, and **Larry Gardner**. “A Milestone in Commercial Space Weather: USTAR Center for Space Weather.”

The following posters were presented at the Fall American Geophysical Meeting held in San Francisco, CA, 14-18 December 2009:

M. Austin, Karl Schrijver, G. L. Siscoe, A. Bhattacharjee, D. W. Longcope, **Jan J. Sojka**, and M. Guhathakurta. “Heliophysics Science.”

Abdallah R. Barakat and **Robert W. Schunk**. “Storm-Time Ion Velocity Distribution in the Generalized Polar Wind.”

Narayan Chapagain** and **Michael J. Taylor**. “Airglow Depletion Zonal Velocities Over Ascension Island.”

Michael David and **Jan J. Sojka**. “Dayside Mid-Latitude F-Region Enhancements During Small or Moderate Geomagnetic Disturbances.”

Larry Gardner and **Robert W. Schunk**. “Generation of Traveling Atmospheric Disturbances During a Pulsating Geomagnetic Storm.”

Inga Maslova**, **Piotr Kokoszka**, **Jan J. Sojka**, and **Lie Zhu**. “Estimation of Sq Variation by Means of Multi-resolution and Principal Component Analyses.”

M. J. McHugh, **Chad S. Fish****, **Michael J. Taylor**, L. L. Gordley, M. E. Hervig, M. E. Summers, and Dave E. Siskind. “DUSt Sounder and Temperature Imager Experiment (DUSTIE).”

S. Patra, E. A. Spencer, W. Horton, **Jan J. Sojka**, and M. L. Mays. “Analysis of the 2007 Year CIR Events Using the WINDMI Model: Energy Distribution and Ring Current Evolution.”

Phil G. Richards, Michael J. Nicolls, **Jan J. Sojka**, and Craig J. Heinselman. “High Latitude M-I Coupling During the Current Solar Minimum: Observations with PFISR.”

Ludger Scherliess, **Donald C. Thompson**, and **Robert W. Schunk**. “Recent Advances in Ionospheric Modeling Using the USU GAIM Data Assimilation Models.”

Ja Soon Shim and **Ludger Scherliess**. “Climatology of Plasmaspheric TEC Obtained From Jason-1.”

Deepak Simkhada**, **Michael J. Taylor**, and **S. J. Franke**. “Gravity Waves Propagation and Momentum Flux in the Mesopause.”

C. Stolle, H. Luhr, J. Park, **Bela G. Fejer**, and M. Rother. “Equatorial Plasma Irregularities: Solar Cycle Dependence and Longitudinal Variation of Local Time Distribution.”

Charles Swenson, M. F. Larsen, **Jan J. Sojka**, and **Chad S. Fish****. “CubeSat Constellations for Measurements of High Latitude Energy Input.”

G. R. Swenson, A. Z. Liu, S. Franke, C. G. Carlson, T. Mangogna, **Michael J. Taylor**, **Pierre Dominique Pautet**, J. H. Hecht, and R. H. Rudy, “The Andes Lidar Observatory (ALO) at Cerro Pachon, Chile, First Light.”

Donald C. Thompson, **Ludger Scherliess**, **Robert W. Schunk**, and **Jan J. Sojka**. “Study of the Topside Ionosphere Using Radio Occultation Data.”

E. Williams, C. Kuo, J. Bor, G. Satori, R. T. Newsome, R. A. Boldi, E. Downes, M. M. Saba, **Michael J. Taylor**, A. B. Chen, and W. A. Lyons. “Halo Observations From the Ground and From Space: Further Checks on the Sprite Polarity Paradox.”

Jeong-Young Ji, **Abdallah R. Barakat**, and **Robert W. Schunk**. “Hybrid Description of Outflowing Ionospheric Plasma: A Monte Carlo/n-Moment Transport Equations Model.”

Yuchen Zhao, **Michael J. Taylor**, **Pierre Dominique Pautet**, C. E. Randall, S. M. Bailey, and J. M. Russell. “Investigating Monochromatic Wave Events in the Summer Polar Mesosphere.”

Lie Zhu, **Jan J. Sojka**, **Robert W. Schunk**, **Zhonghua Xu****, and **Piotr Kokoszka**. “Study of the Ring Current Variability with the Use of Ground-Based Magnetometer Measurements and New Statistical Technique: Preliminary Results.”

Robert W. Schunk, **Ludger Scherliess**, **Jan J. Sojka**, **Donald C. Thompson**, and **L. Zhu** presented a paper titled “Ionosphere Specifications and Forecasts” at the ORION Conference held in Dayton, OH, 12-14 January 2010.

Faculty Publications

undergraduate* graduate**

Biology

Luis A.F. Teixeira, Larry J. Gut, Rufus Issacs, and **Diane G. Alston**. 2009. Reproductive Maturity of Cherry Fruit Fly (Diptera: Tephritidae) in Managed and Natural Habitats. *Environmental Entomology* 38:955-961.

Renee J. Pereault*, Mark E. Whalon, and **Diane G. Alston**. 2009. Field Efficacy of Entomopathogenic Fungi and Nematodes Targeting Caged Last-instar Plum Curculio (Coleoptera: Curculionidae) in Michigan Cherry and Apple Orchards. *Environmental Entomology* 38:1126-1134.

MieJung Park, **Hyoungil Oh****, and **David A. York**. 2009. Enterostatin Affects Cyclic AMP and ERK Signaling Pathways to Regulate Agouti-related Protein (AgRP) Expression. *Peptides* 30:181-190.

MeiJung Park, Jeffrey Farrell, Karalee Lemmon, and **David A. York**. 2009. Enterostatin Alters Protein Trafficking to Inhibit Insulin Secretion in Beta-TC6 Cells. *Peptides* 30:1866-1873.

Chris R. Feldman**, **Edmund D. Brodie Jr.**, Edmund D. Brodie III, and **Michael E. Pfrender**. 2009. The Evolutionary Origins of Beneficial Alleles during the Repeated Adaptation of Garter Snakes to Deadly Prey. *PNAS* 103:13415-13420.

Hélène Morlon, **Ethan P. White**, Rampal S. Etienne, Jessica L. Green, Annette Ostling, David Alonso, Brian J. Enquist, Fangliang He, Allen Hurlbert, Anne E. Magurran, Brian A. Maurer, Brian J. McGill, Han Olf, David Storch, and Tommaso Zillio. 2009. Taking Species Abundance Distributions Beyond Individuals. *Ecology Letters* 12:488-501.

S. K. Morgan Ernest, **Ethan P. White**, and James H. Brown. 2009. Changes in a Tropical Forest Support Metabolic Zero-sum Dynamics. *Ecology Letters* 12:507-515.

Frank J. Messina, **Michelle Mendenhall**** and **Jake C. Jones****. 2009. An Experimentally Induced Host Shift in a Seed Beetle. *Entomologia Experimentalis et Applicata* 132:39-49.

Frank J. Messina and **Jake C. Jones***. 2009. Does Rapid Adaptation to a Poor-quality Host by *Callosobruchus maculatus* (F.) Cause Cross-adaptation to Other Legume Hosts? *Journal of Stored Products Research* 45:215-219.

Aaron M. Duffy**, Scot A. Kelchner, and **Paul. G. Wolf**. 2009. Conservation of Selection on *matK* Following an Ancient Loss of its Flanking Intron. *Gene* 438:17-25.

Joshua P. Der**, John A. Thomson, **Jerran K. Stratford***, and **Paul G. Wolf**. 2009. Global Chloroplast Phylogeny and Biogeography of Bracken (*Pteridium*: Dennstaedtiaceae). *American Journal of Botany* 96:1041-1049.

Joseph S. Wilson**, **Olivia Messinger**** and Terry Griswold. 2009. Variation Between Bee Communities on a Sand Dune Complex in the Great Basin Desert, North America: Implications for Sand Dune Conservation. *Journal of Arid Environments* 73:666-671.

Diane Alston, Brent Black, and **Marion Murray**. 2009. Raspberry Horntail: *Hartigia cressonii*. Utah State University Extension Utah Pests Fact Sheet ENT-132-09. Utah State University, Logan, UT, 4 pp.

Timothy A. Gilbertson, **Tian Yu**** and **Bhavik P Shah****. 2009. Gustatory Mechanisms for Fat Detection. In, *Frontiers in Neuroscience, Fat Detection: Taste, Texture and Post Ingestive Effects*. J.-P. Montmayeur and J. le-Coutre, eds. Taylor & Francis, Boca Raton, FL, pp. 83-104.

Robert O. Hall, Jr., **Michelle A. Baker**, **Christopher D. Arp****, and Benjamin J. Koch. 2009. Hydrologic Control of Nitrogen Removal, Storage and Export in a Mountain Stream. *Limnology and Oceanography* 54:2128-2142.

Jason P. Roth, **Joseph Li**, Donald F. Smee, John D. Morrey, and Dale L. Barnard. 2009. A Recombinant, Infectious Human Parainfluenza Virus Type 3 Expressing the Enhanced Green Fluorescent Protein for Use in High-throughput Antiviral Assays. *Antiviral Research* 82:12-21.

Joseph Li. 2009. Event Highlights: The 12th SCBA International Symposium at the Academia Sinica. *Asia-Pacific BioTechnology News*. 13:44-46.

David Tanner, Terry Griswold, and **James Pitts**. 2009. Revision of *Mecanthidium* (Hymenoptera: Megachilidae). *Journal of Hymenoptera Research* 18:183-191. UAES no. 8098.

David Tanner, **Nicole Boehme****, and **James Pitts**. 2009. Revision of *Acanthophotopsis* (Hymenoptera: Mutillidae). *Journal of Hymenoptera Research* 18:192-204. UAES no. 8066.

James Pitts and **Joe Wilson****. 2009. Description of the Female of *Acrophotopsis* (Hymenoptera: Mutillidae) and Synonymy of *Sphaerophthalma dirce*. *Journal of Hymenoptera Research* 18:205-211. UAES no. 8063.

Joe Wilson** and **James Pitts**. 2009. Species Boundaries of *Sphaerophthalma unicolor* (Cresson) (Hymenoptera: Mutillidae): Is Color Useful for Differentiating Species? *Journal of Hymenoptera Research* 18:212-226. UAES no. 8078.

Kevin Williams** and **James Pitts**. 2009. Eight New Species of *Lomachaeta* Mickel and the Synonymy of *Smicromutilla* Mickel (Hymenoptera: Mutillidae). *Journal of Hymenoptera Research* 18:227-243. UAES no. 8079.

Chemistry & Biochemistry

James J. Danford**, **Piotr Dobrowolski**, and **Lisa M. Berreau**. 2009. Thioester Hydrolysis Reactivity of an Fe(III)Zn(II) Complex. *Inorganic Chemistry* 48:11352-11361.

Gregory K. Smith, Zhihong Ke, **Alvan C. Hengge**, Dingguo Xu, Daiqian Xie, and Hua Guo. 2009. Active-Site Dynamics of SpvC Virulence Factor from *Salmonella typhimurium* and Density Functional Theory Study of Phosphothreonine Lyase Catalysis. *Journal of Physical Chemistry B* 113:15327-15333.

Steve Scheiner, P.G. Seybold. 2009. Quantum Chemical Analysis of the Energetics of the anti- and gauche- Conformers of Ethanol. *Structural Chemistry* 20:43-48.

H.D.B Jenkins, J.F. Liebman, M. Ponkivar, **Steve Scheiner**. 2009. The Heat Capacities and Standard Entropies of Corresponding Potassium and Ammonium Ion Species: Is There a Constant Difference? *Structural Chemistry* 20:31-35.

M. Solimannejad, **Steve Scheiner**. 2009. Nature of Interactions in Open-Shell Complexes Pairing H₂X with HXX, X=S,O. *Molecular Physics* 107:713-719.

S. Scheiner. 2009. Identification of Spectroscopic Patterns of CH--O H-Bonds in Dipeptides. *Journal of Physical Chemistry B* 113:10421-10427.

S. Scheiner. 2009. Ingredients Necessary for Proton Transfer in Enzymes. *Israel Journal of Chemistry* 49:139-147.

M. Solimannejad, S. Massahi, **S. Scheiner**. 2009. Existence and Characterization of HOO-HOOH Radical-Molecule Complexes: A Computational Study. *Journal of Molecular Structure: Theochem* 913:50-53.

Computer Science

Renee Bryce. R. Bryce, S. Sampath, & A. Memon. 2010. Developing a single model and test prioritization strategies for event-driven software. *IEEE Transactions on Software Engineering*.

Geology

Katrina R. DeNosaquo, Robert B. Smith, and **Anthony R. Lowry.** 2009. Density and Lithospheric Strength Models of the Yellowstone-Snake River Plain Volcanic System from Gravity and Heat Flow Data. *Journal of Volcanology and Geothermal Research* 188:108-127.

Marta Pérez-Gussinyé, Marianne Metois, Manel Fernández, Jaume Vergés, Javier Fullea, and **Anthony R. Lowry.** 2009. Effective Elastic Thickness of Africa and Its Relationship to Other Lithospheric Proxies and Surface Tectonics. *Earth and Planetary Science Letters* 287:152-167.

Prosper M. Nude, John W. Shervais, K. Attoh, Scott K. Vetter, and **Corey Barton.** 2009. Petrology and Geochemistry of Nepheline Syenite and Related Carbonate-Rich Rocks in the Pan-African Dahomeyride Orogen, Southeastern Ghana, West Africa. *Journal of African Earth Sciences*, doi: 10.1016/j.jafrearsci.2009.03.010.

John W. Shervais and **Scott K. Vetter.** 2009. High-K Alkali Basalts of the Western Snake River Plain: Abrupt Transition from Tholeiitic to Mildly Alkaline Plume-Derived Basalts, Western Snake River Plain, Idaho. *Journal of Volcanology and Geothermal Research*, doi: 10.1016/j.jvolgeores.2009.01.023.

Jason E. Heath, Thomas E. Lachmar, James P. Evans, Peter T. Kolesar, and **Anthony P. Williams.** 2009. Hydrogeochemical Characterization of Leaking, Carbon Dioxide-Charged Fault Zones in East-Central Utah, With Implications for Geological Carbon Storage. Carbon Sequestration and Its Role in the Global Carbon Cycle. Brian McPherson and Eric T. Sundquist, Eds. Am. Geophys. Union Monograph v. 183.

Mathematics and Statistics

J. R. Stevens and Nicholas G. 2009. Metahep: Meta-analysis of Hierarchically Dependent Gene Expression Studies. *Bioinformatics* 25:2619-2620.

M. B. Hooten and A. R. Cangelosi. 2009. Models for Bounded Systems with Continuous Dynamics. *Biometrics* 65:850-856.

M. B. Hooten, C. K. Wikle, S. Sheriff, and J. Rushin. 2009. Optimal Spatio-temporal Hybrid Sampling Designs for Ecological Monitoring. *Journal of Vegetation Science* 20:639-649.

M. B. Hooten, M. J. Garlick,** and **J. A. Powell.** 2009. Change of Support in Inverse Implementations of Statistical Differential Equation Models. *Proceedings of the American Statistical Association* [CD-ROM], Alexandria, VA: American Statistical Association: pp. 1847-1857.

J. B. Odei,** **M. B. Hooten,** and J. Jin. 2009. Hierarchical Spatio-temporal Models for Intermountain Snow Water Storage. *Proceedings of the American Statistical Association* [CD-ROM], Alexandria, VA: American Statistical Association: pp. 870-878.

Physics

Timothy E. Doyle, Adam T. Tew*, Rahul Jain*, and **David A. Robinson.** 2009. Effects of Aggregation on the Permittivity of Random Media Containing Monodisperse Spheres. *Journal of Applied Physics* 106:114104.

J. R. Dennison, Joshua L. Hodges, J. Duce*,** and **Amberly Evans*.** 2009. Flight Experiments on the Effects of Contamination on Electron Emission of Materials. *Proceedings of the 1st AIAA Atmospheric and Space Environments Conference.* Paper number: AIAA-2009-3641.

The Center for Atmospheric & Space Sciences

Don D. Rice, J. Vince Eccles, **Jan J. Sojka, John W. Raitt, J. Brady,** and R. D. Hunsucker. 2009. A Frequency Agile, Distributed Sensor System (FADSS) to Address Space Weather Effects Upon Ionospherically-Dependent Systems. *Radio Science* 44 RS0A29, doi:10.1029/2008/RS004083.

Jan J. Sojka, R. L. McPherron, A. P. van Eyken, M. J. Nicolls, C. J. Heinselman, and J. D. Kelly. 2009. Observations of Ionospheric Heating During the Passage of Solar Coronal Hole Fast Streams. *Geophysical Research Letters* 36 L19105, doi:10.1029/2009GL039064.

Ludger Scherliess, Donald Thompson, and **Robert W. Schunk.** 2009. Ionospheric Dynamics and Drivers Obtained From a Physics-Based Data Assimilation Model. *Radio Science* 44 RSOA32, doi:10.1029/2008RS004068.

W. Kent Tobiska. 2009. Operational Space Weather Entering a New Era. *Space Weather* 7 S10003, doi:1029/2009SW000510.

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