



Science Scene

Research Report

January 2008 to April 2008

A Publication of the College of Science, Utah State University

—The Dean's Corner—

Congratulations to all on another productive academic year. I have enjoyed getting to know the USU community during my first year. There are some exciting faculty research projects underway and an excellent group of students working with our faculty. It has been my pleasure to celebrate many of these activities and accomplishments during the various award ceremonies on campus.

Undergraduate research continues to be a College of Science strength as indicated by our most recent Goldwater Scholar award recipients. Tamara Jeppson, with double majors in physics and geology, and Jodie Tvedtnes, a physics major, were named Goldwater Scholars in March. Sydney Chamberlin, a physics and math double major, and Cody Tramp, a biology and biochemistry major, received Honorable Mention in the Goldwater Scholar competition. Jodie Tvedtnes also received the distinction of being one of three physics students nationwide to win the Society of Physics Students Outstanding Award for Undergraduate Research. For this award she will have her way paid to present her research at the 2008 International Conference of Physics Students in Cracow, Poland in August. Congratulations to these, and all of our other fine Utah State University student researchers.

Our College of Science faculty and graduate student recipients of research, teaching and mentoring awards are in this report. Please join me in recognizing these individuals for their achievements. I would also like to recognize Steve Aust for his contributions to Utah State University during his years of service. Steve is retiring from his position in the Department of Chemistry and Biochemistry.

Enjoy a productive summer.

— College of Science Contract & Grant Activity —

Amounts (# of proposals)	January 2008	February 2008	Cumulative Totals for FY07-08
Proposals Submitted	\$7,364,571.24 (26)	\$6,225,484.00 (15)	\$38,006,080.24 (41)
Awards Received	\$630,090.00 (7)	\$954,722.00 (8)	\$5,714,192.92 (15)

Amounts (# of proposals)	March 2008	April 2008	Cumulative Totals for FY07-08
Proposals Submitted	\$5,370,250.00 (20)	\$4,267,093.55 (11)	\$47,643,423.79 (72)
Awards Received	\$509,496.62 (9)	\$904,195.77 (12)	\$7,127,885.31 (36)



— College of Science Awards —

— Undergraduate Student Awards & Special Recognition —

Undergraduate Teaching Fellow Award—2007-2008	Justin A. Peterson, Biology
Honors Graduates—2007-2008	William Israelsen, Biology Michael Whyte, Biology
Scholar of the Year—2007-2008	Ashley Wilkinson, Biology
Valedictorian—Fall 2007	Amber Wilk, Mathematics & Statistics; Jim Cangelosi, Faculty Escort
Valedictorian—Spring 2008	Ryan Campbell, Chemistry & Biochemistry; Stephen Bialkowski, Faculty Escort
Undergraduate Student Researcher of the Year—2007-2008	Arthur Mahoney, Computer Science
Goldwater Scholars	Tamara Jeppson Jodie Tvedtnes
Goldwater Honorable Mentions	Sydney Chamberlin Cody Tramp

— Undergraduate Scholarships, Grants, & Fellowships —

College of Science Undergraduate Research Minigrants—2008-2009

Randy Bowen, Biology
Cody Tramp, Biology
Bradley Hintze, Chemistry & Biochemistry
Rochelle Kellet, Chemistry & Biochemistry
Kathleen Kirkham, Geology
Joseph Eason, Mathematics & Statistics
Morgan Summers, Mathematics & Statistics

Benjamin Toney, Biology
Amanda Bingham, Chemistry & Biochemistry
Sara Huefner, Chemistry & Biochemistry
Tamara Jeppson, Geology
Natali Zollinger, Geology
Taren McKenna, Mathematics & Statistics

Willard L. Eccles Undergraduate Fellowships—2008-2009

Sherry Baker, Biology
Evan Lytle, Biology
Joseph Delka, Chemistry & Biochemistry
Andrew Pound, Mathematics & Statistics
Brian Myers, Physics

Stephanie Croasdell, Biology
Ryan Berry, Chemistry & Biochemistry
Eric Sibbensen, Chemistry & Biochemistry
Sydney Chamberlin, Physics
Richard Wilson, Physics

College of Science Scholarships—2008-2009

Sherry Baker, Biology
Colby Bingham, Chemistry & Biochemistry
Sydney Chamberlin, Physics
Spencer Hyde, Chemistry & Biochemistry
Erik Sibbensen, Chemistry & Biochemistry
Braden Parker, Biology and Chemistry & Biochemistry

Garrett Bentley, Biology
Paul Bingham, Biology
Bradley Hintze, Chemistry & Biochemistry
Ammon Larsen, Biology
Benjamin Toney, Biology

Theodore M. Burton Scholarship—2008-2009	Merissa Swainston, Mathematics & Statistics
Oscar Wood Cooley Scholarship—2008-2009	Amanda Bingham, Chemistry & Biochemistry
Charles J. Sorenson Scholarship—2008-2009	David Denson, Interdisciplinary Studies

— College of Science Awards —

Campbell Scientific Science Scholarship—2008-2009 Bradley Hintze, Chemistry & Biochemistry

Joseph E. Greaves Scholarship—2008-2009..... Ammon Larsen, Biology

Questar Science Scholarship—2008-2009..... Hans Anderson, Geology
 Heidi Pearce, Geology
 Richard Wilson, Physics

Seely-Hinckley Scholarships—2008-2009

Ryan Allen, Chemistry & Biochemistry	Calvin Burton, Physics/Mathematics & Statistics
Clayton Cook, Biology	Dustin Larsen, Biology

Lillywhite Scholars—2008-2009

Lincoln Andreasen, Biology	Sherry Baker, Biology
Amanda Bingham, Chemistry & Biochemistry	Sydney Chamberlin, Physics
David Denson, Interdisciplinary Studies	Bradley Hintze, Chemistry & Biochemistry
Shane Hohman, Biology	Ammon Larsen, Biology
Braden Parker, Biology and Chemistry & Biochemistry	Tracy Upton, Biology

— Graduate Student Awards & Special Recognition —

Willard L. Eccles Graduate Fellowship—2007-2008 Desareé Williams, Biology

Presidential Graduate Fellowships—2007-2008 Mark Haney, Chemistry & Biochemistry
 Christopher Hall, Computer Science

Vice President for Research Graduate Fellowships—2007-2008 Debra Lowe, Biology
 David Hansen, Physics

ZoBell Graduate Scholarship—2008-2009 Katarzyna Rudzka, Chemistry & Biochemistry

Graduate Student (MS) Researcher of the Year—2007-2008 Amanda Cangelosi, Mathematics & Statistics

Graduate Student (PhD) Researcher of the Year—2007-2008 Dmitry Zubarev, Chemistry & Biochemistry

Graduate Student Teacher of the Year—2007-2008 Nicole Davidson, Biology

— Faculty College Awards & Recognition —

College of Science Undergraduate Research Mentor of the Year—2007-2008Alvan Hengge, Chemistry & Biochemistry

College of Science Faculty Researcher of the Year—2007-2008 James Powell, Mathematics & Statistics

College of Science Faculty Teacher of the Year—2007-2008 Keith Mott, Biology

College of Science Faculty Advisor of the Year—2007-2008 David Peak, Physics

— Student Showcase Participants April 1, 2008 —

Name of Student	Title of Project	Dept	Mentor
AmberLeigh Muller	Alkaline Commercial Wash Water and Bacterial Survival	Biology	Anne Anderson
Bryce Osborne	Comparison of Methylation Patterns Concerning 5 Transcription Factors	Biology	Ken White
Christopher Bowen	A Comparison of Experimental and Computational Methods of Identifying Gene Regulatory Signals	Biology	Paul Cliften
Chris Peterson	Simultaneous Detection of 500 Human Cytokine and Chemokine Proteins Human Cancer A549 Cells Infected with Oncolytic Bluetongue Virus Serotype	Biology	Joseph Li
Dustin Clark	Characterization of Waste Water Generated by Coal Pyrolysis Using GC-MS and FTIR Spectroscopy	Biology	Charley Langley
Katherine Grover	Identification of ncRNAs in <i>Candida Tropicalis</i> using Comparative Sequence Analysis of Closely Related Species	Biology	Paul Cliften
Michael Whyte	Choosing Nucleic Acid Sequences for Phylogenetic Studies of the Rust Genus <i>Phragmidium</i>	Biology	Brad Kropp
Nathaly Carranza	Growth Parameters for Antifungal Cyclic Lipononapeptide Production	Biology	Jon Takemoto
Rochelle Lambertson	Trophoblast Stem Cell Differentiation	Biology	Ken White
Uyen Lam	Analysis of Apoptotic Gene Expression in Human A549 Lung Carcinoma after Infection with Oncolytic Bluetongue Virus Serotype 17	Biology	Joseph Li
Derek Price	Analysis of the Reactions of Secondary and Tertiary Amines with O ₃ and NO _x Using a Proton-Transfer Reaction Mass Spectrometer and an Aerosol Mass Spectrometer	Chemistry & Biochemistry	Phil Silva
Bradley Hintze	The First Structural View of the TRAMP Component Mtr4	Chemistry & Biochemistry	Sean Johnson
Joseph Delka	Discovering the Role of the PRMT N-terminus in Sub-Cellular Location	Chemistry & Biochemistry	Joan Hevel
Sara Huefner	Mutations of Critical Amino Acids in the Human Enzyme PTP 1B	Chemistry & Biochemistry	Alvan Hengge
Scott Johnson	Optimizing the Expression and Purification of PRMT1	Chemistry & Biochemistry	Joan Hevel
Art Mahoney	Scalable, Parallel, and Distributed Approximate Shortest Paths in Massive Graphs	Computer Science	Dan Watson
Scott Fehser & Jeremy Neff	Gene Analysis of <i>Mycobacterium</i> through Bioinformatics	Computer Science	Ron Sims
Melissa Jackson	OSL Dating and Geoarchaeology at the Paleoindian Health Site, San Juan Mountains, Colorado	Geology	Joel Pederson
Tamara Jeppson	Relationship between Seismic Velocity and Fracture Densities at the San Andreas Fault Observatory at Depth	Geology & Physics	James Evans
Nathan Voge	Offense, Offender, and Victim Predictors of Sexual Victimization of Children vs. Adolescents	Math & Statistics	Jamison Fargo
Shelley Moss	Measurement Error-Based Weights in Distance Measures	Math & Statistics	John Stevens
Aaron Anderson	Nanostructuring	Physics	Haeyeon Yang
Adam Tew	Effects of Microstructure on the Effective Properties of Soils, Tissues, and Other Complex Media	Physics	T.E. Doyle

— Student Showcase Participants April 1, 2008 —

Name of Student	Title of Project	Dept	Mentor
Cade Perkins	Creating Boron Delta Layers on Silicon: Investing Decaborane (14) as Source in Chemical Vapor Deposition	Physics	T.C. Shen
Cameron Bodily	How Magnetometers Monitor Solar Storms	Physics	Jan Sojka
Casey Clegg	Construction and Characterization of Electrodes for Oxygen Diffusion Rate Determination in Soil	Physics	Scott Jones
Daniel Arnfield	Temperature Dependence of Kapton HN Breakdown Voltages	Physics	J.R. Dennison
Ethan Lindstrom	Adsorption Isotherms for Nitrogen (N ₂) on Graphite	Physics	J.R. Dennison
Eve Day	Multi Path FTIR Agriculture Air Pollution Measurement System	Physics	Michael Wojcik
Jarron Lembke	Temperature Waves in the Upper Atmosphere	Physics	Vincent Wickwar
Jennifer Albretsen	Adsorption Isotherms for Nitrogen (N ₂) on Graphite	Physics	J.R. Dennison
Jodie Tvedtnes	Noctilucent Clouds from Above and Below	Physics	Michael Taylor
Kathryn Chapman	The Physics of Weapons	Physics	Farrell Edwards
Levi Fifield	Optical Particle Characterization	Physics	Allen Howard
Michael Larson	Auger Electron Spectroscopy of Metal, Insulator, and Semiconductor	Physics	T.C. Shen
Richard Phillips	Investigating Seasonal Variability in Short-Period Gravity Waves Over Bear Lake Observatory, Utah	Physics	Michael Taylor

— National Conference on Undergraduate Research April 13-16, 2008—

Name	Title	Dept	Mentor
Christopher Peterson & Uyen Lam	Analysis of Apototic Gene Expression in Human A549 Lung Carcinoma After Infection with Oncolytic Blue Tongue Virus Serotype 17	Biology	Joseph Li
Katherine Grover	Identification of Non-Coding RNAs in Candida Tropicalis Using Comparative Sequence Analysis of Closely Related Species	Biology	Paul Cliften
R. Chris Bowen	A Comparison of Experimental and Computational Methods of Identifying Gene Regulatory Signals	Biology	Paul Cliften
Sherry Baker	Metastatic Melanoma and Carcinoma Metalloproteinase Secretion	Biology	Daryll DeWald

— Research on Capital Hill January 24, 2008 —

Name	Title	Dept	Mentor
Evan Lytle	The Effects of Degraded Water Quality on Nutrient Limitation	Biology	Michelle Baker
Mike Larson	Symbiotic Bacteria in Common Utah Pests Protects Against Parasitism but not Predation	Biology	Ted Evans
Sherry Baker	Metastatic Melanoma and Carcinoma Metalloproteinase Secretion	Biology	Daryll DeWald
Sara Huefner	Mutations of Critical Amino Acids in the Human Enzyme PTP 1B	Chemistry & Biochemistry	Alvan Hengge
Shannon Babb & Lysie Daley	Petrographic Mapping of Sandstones from the Neoproterozoic Jesse Ewing Canyon Formation, Unitah Mountains, Utah	Geology	Carol Dehler
BJ Myers	Error-Correction in Distributed Computational Networks Using Self-Organized Collective Dynamics	Physics	David Peak
Mitchell Bassett	Characterizing Histone Modification to the Bovine Oct4 Gene in Early Embryonic Development Using Carrier Chromatin Immunoprecipitation	Epigenetics	Ken White

— Utah Conference on Undergraduate Research Participants February 29, 2008—

Name	Title	Dept	Mentor
Mary McMillan	Identification of Putative QTL for Parasite Resistance in Sheep	Biology	Tim Shay
Sherry Baker	Metastatic Melanoma and Carcinoma Metalloproteinase Secretion	Biology	Daryll DeWald
Mitchell Bassett	Characterizing Histone Modification to the Bovine Oct4 Gene in Early Embryonic Development Using Carrier Chromatin Immunoprecipitation	Epigenetics	Ken White
Lysie Daley & Shannon Babb	Petrographic Mapping of Sandstones from the Neoproterozoic Jesse Ewing Canyon Formation, Unitah Mountains, Utah	Geology	Carlo Dehler
Sydney Chamberlin	Computer Modeling of Solar Ion Radiation Processing of Planetary Surface Materials	Planetary Science	Roy Christoffersen
Evan Lytle	The Effect of Degraded Water Quality on Nutrient Limitation	Ecology	Michelle Baker
Christopher Peterson	Simultaneous Detection of the Expression Levels of 507 Human	Biology	Joseph Li

— URCO Recipients Spring 2008—

Name	Title	Dept	Mentor
Stephanie Croasdell	Alteration of Salt Sensitivity in an Animal Model of Hyperinsulinemia	Biology	Tim Gilbertson
Justin Dekany	Initial Time Dependent Resistivity of Insulating Polymers	Physics	J.R. Dennison
Arash Garrossian	Carbohydrate and Cyclopamine Conjugates on Anticancer Agent	Chemistry & Biochemistry	Ton Chang
Christina Hansen	DcoH and DcoHalpna Interface Residues Affect Protein Function	Chemistry & Biochemistry	Joan Hevel
Jesse Hayes	Operation and Calibration of an <i>IN SITU</i> Electrostatic Field Transition Probe	Physics	J.R. Dennison
Heidi Pearce	Study of Sand Dunes on the Snake River Plain	Geology	Tammy Rittenour
Christopher Peterson	Differential Eddects on RNAi on Toll-Like Receptors in Oncolytic Bluetongue Virus Infected Human Cancer A549 Cells	Biology	Joseph Li

— University Undergraduate Research Fellows —

University Research Fellowships are designed for students who are interested in graduate or professional study following the undergraduate degree, who are ambitious, who may be interested in preparing for major Fellowships such as the Rhodes, Truman (public service), Goldwater (science), or Udall (environmental), and who “want to make a difference” in their communities and in the world. A Fellowship—in contrast to a scholarship—offers students the experiential learning that will result in dividends when applying for graduate study. Incoming undergraduate students who receive Presidential Scholarships are invited to apply for the University Fellowship.

Associate Dean Richard Mueller mentors College of Science Research Fellows initially. During their first semester, students tour labs and meet faculty in Biology, Chemistry & Biochemistry, Computer Science, Geology, Mathematics & Statistics, and Physics. Select faculty, including each department’s undergraduate research coordinator, describe the exciting and diverse opportunities in research available to students in their areas of interest. By the end of the first semester, or the first year for those who need more time, each Fellow is teamed with a faculty mentor in his/her area of interest.

Questions regarding the URF Program in the College of Science should be directed to Associate Dean Richard Mueller (rmueller@biology.usu.edu).

Name	Major	Mentor
Thomas Anderson	Biology	Katarina Stroffekova
Cyri Dixon	Biology	Wayne Wurtsbaugh
Kevin Fifer	Biochemistry	Bob Brown
Jenna Hall	Biology	Don Sinex
Lydia Howes	Biochemistry	Scott Ensign
Colby Kearl	Biology	Tom Chang
Yalemi Morales	Biochemistry	Joseph Li
Steven Mosher	Computer Engineering	Scott Cannon
Matthew Petersen	Nutrition and Food Sciences	Tim Gilbertson
Landon Hemsley	Computer Science	Scott Cannon

— VPR Seed Grants Selected for Funding July 1, 2008 —

RC

- 1) **Mike Pfrender** (PI), Biology, and **Edmund Brodie**, Biology, "Genomic Sequence of Multiple Tetrodotoxin-resistant Voltage Gated Sodium Channels".
- 2) Helga Van Miegroet (PI), Wildland Resources, **Anne Anderson**, Biology, and Astrid Jacobson, Plants, Soil, and Climatology, "Can Fire-induced Soil Water-repellency be Reversed?".
- 3) **John Shervais** (PI), Geology, "HOTSPOT: The Snake River Scientific Drilling Project: Tracking the Yellowstone Hotspot through Space and Time".

SPARC

- 1) **Tim Doyle** (PI), Physics, David Britt, Biological & Irrigation Engineering, and Rayhan Baktur, Electrical & Computer Engineering. "Innovative Nanoparticle Technologies for Treating Disease".

Information and Deadline for Next Round of Seed Grants —

Program information available at:

GEM: http://research.usu.edu/htm/grants_funding/gem

Research Catalyst (RC): http://research.usu.edu/htm/grants_funding/rc

SPARC: http://research.usu.edu/htm/grants_funding/sparc

Deadline for proposal submission to your department head: September 1, 2008

— Robins Awards —

Graduate Research Assistant Award **Dmitry Zubarev, Chemistry & Biochemistry**

This award is for superior research capability and academic excellence.

Faculty Advisor of the Year **David Peak, Physics**

Dr. Peak's efforts with students have helped the department field a Rhodes Scholar, Marshall Scholar, Fullbright Scholar, five Goldwater Scholars and two honorable mention Goldwater Scholars.

Legacy of Utah State Award **Bradley Hintze, Chemistry & Biochemistry**

This award was created in memory of those involved in the 2005 USU van accident. The award is given each year to a student who embodies the true spirit, heart, and soul of USU and demonstrates love and support for the university family, while leading with a vision of hope for the future.

— Hot Topics from the Sponsored Programs Office —

1) NIH Publication Policy

NIH has released its new Public Access Policy which became effective April 7, 2008. NIH is now requiring that the author's final version of any peer-reviewed journal article resulting from NIH-funded activities, including NIH flow through, must be submitted to the PubMed Central (PMC) repository. Future funding is contingent upon compliance with these new requirements. Please see our website (<http://spo.usu.edu/htm/policies-procedures/nih>) for compliance issues and instructions.

2) Delinquent Reporting

Sponsored Programs has instituted a dual approach to address a delinquency problem we have observed for quite some time regarding final technical and invention reports. We are experiencing more frequent notices from sponsoring agencies indicating that reports are delinquent. Since reports can negatively impact future funding for the entire university, SPO and the VPR feel it is necessary to implement new procedures to assure improved timeliness.

Procedures enacted 10/01/07:

Phase 1

SPO will distribute an updated report to all Deans and Center Directors on a monthly basis. This report will be separated into two categories, those that are "recently delinquent" (anything overdue) and "extremely delinquent" (> 6 months overdue).

Phase 2

Sponsored Programs will place a "hold" on the setup of any new accounts for PIs that have seriously delinquent reports (> 6 months overdue). Accounts will be released as soon as SPO receives documentation that the delinquent report has been submitted.

3) Grants.gov

Grants.gov is in the process of moving from their PureEdge software to Adobe application packages. Right now most Grants.gov applications are still using the PureEdge software while several have begun to use the Adobe application. However, the transition to Adobe will begin to occur more quickly starting in June 2008. Grants.gov recommends downloading both PureEdge and a compatible version of Adobe Reader to seamlessly apply for grants. Grants.gov is currently transitioning to phase out of PureEdge software to using Adobe Reader software exclusively. For a period of time applicants will still be able to use PureEdge as it is applicable.

DATES TO REMEMBER

College of Science Faculty Retreat

August 13, 2008

8:30 am to 4:30 pm

Space Dynamics Laboratory, Innovation Campus

1695 North Research Park Way

More detailed information will be distributed at a later date.

— STUDENT ACTIVITIES —

Student Awards, Recognition & Grants

undergraduate*; graduate**

Geology

Kelly K. Bradbury** (PhD) received a \$5,000 summer grant from the DOSECC consortium. DOSECC [Direct Observation and Sampling of the Earth's Continental Crust] is a group of 58 universities that support scientific drilling worldwide. Kelly's project will examine rock samples from 3 km deep from a drill hole that crosses the San Andreas fault at depth.

Kelly K. Bradbury** received the Kenneth H. Crandall Memorial Grant which is awarded annually to two deserving graduate students through the American Association of Petroleum Geologists Grants-in-Aid Program and is endowed by the AAPG Foundation through generous contributions from the Chevron Emeritus Exploration Managers Group, from his two sons, Ken, Jr. and William Crandall and from Chevron Corporation.

Kelly K. Bradbury** received \$10,000 for the Lucien LaCoste Scholarship from the Society of Exploration Geophysicists for the academic year 2008-2009 to correlate geological information from Phase III core from SAFOD, Parkfield, CA with geophysical well-logging data.

Meagan R. DeRaps** received \$500 for the J. Stewart Williams Graduate Fellowship for her research on "The Petrogenesis of Two Pulses of Basaltic Volcanism and Their Implications for the Evolution of the Western Snake River Plain, Mountain Home, Idaho."

David H. Forand** received a \$5,000 grant from ExxonMobil Corporation for his analyses of fault zones in southern California titled Examination of Strike-slip Faults in Crystalline Rocks, Southern California.

Jonathan E. Harvey** received Honorable Mention from the National Science Foundation Graduate Research Fellowship Program (NSF-GRFP) for his work on linking the record of an arroyo cutting and filling in the headwaters of a drainage in southern Utah with the record of paleoflooding in the slot canyon downstream.

Jonathan E. Harvey** received \$2500 for the 2008 Howard Award from the Quaternary Geology and Geomorphology division of the Geological Society of America. This award is for the best MS student research proposal in Geomorphology. Jon's research is titled "Reconciling valley-fill and canyon-

paleoflood alluvial records in the Coyote-Buckskin drainage, Colorado Plateau."

Tamara N. Jeppson*, an undergraduate dual major in geology and physics, received a Goldwater Scholarship for the 2008-2009 year for her work on seismic energy radiation and attenuation within fault zones.

Tamara N. Jeppson* and **Devin J. Peterson*** each received the Utah Geological Association 2008 Field Camp Scholarship.

Michelle C. Summa** received \$7,500 from ExxonMobil's 2008 Geoscience Grant program for her research on "The Alluvial History of Kanab Creek." She will be describing the alluvial stratigraphy along the Kanab Creek corridor and will utilize OSL dating to relate terrace and valley-fill deposits to regional alluvial and climate records to understand the alluvial history of Kanab Creek.

Erin M. Tainer** received a Geoscience Research Scholarship of \$800 from the Association for Women Geoscientists, Salt Lake Chapter, to cover travel expenses to present her research paper titled "High Resolution Holocene Chronostratigraphy of Terraces in Eastern Grand Canyon: Cultural Significance and River Response to Paleoclimate."

Quinn M. Walker* received a URS Scholarship and Internship for the 2008-2009 academic year. The URS Corporation is a globally recognized engineering firm based in Salt Lake City. The internship was established to encourage Geology students to consider a career in environmental consulting.

The following students received student grants from the Geological Society of America:

Meagan R. DeRaps** received \$1100 for her research on "The Petrogenesis of Two Pulses of Basaltic Volcanism and Their Implications for the Evolution of the Western Snake River Plain, Mountain Home, Idaho."

Jonathan E. Harvey* received \$1300 for his research on "Reconciling Valley-fill and Canyon-Paleoflood Alluvial Records in the Coyote-buckskin Drainage, Colorado Plateau"

Michelle C. Summa** received \$2250 for her research on "The Alluvial History of Kanab Creek."

Student Awards, Recognition & Grants
undergraduate*; graduate**

The Center for Atmospheric & Space Sciences

Matthew Bailey** was selected to receive an Outstanding Student Paper Award from the American Geophysical Union for his presentation at the 2007 Fall Meeting in San Francisco, California.

Student Presentations

Geology

Marlon Jean** presented a poster titled “In-situ LA-ICP-MS Analysis of Pyroxene in the Peridotite of the Coast Range Ophiolite, California” at the Geological Society of America Cordilleran/Rocky Mountain Convention, Las Vegas, Nevada, 19-21 March 2008.

Dan Rybczynski** presented a poster titled “A Mid-Neoproterozoic Western Interior Seaway: A 766 Ma Transgression Recorded at the Utah-Colorado Border” at the Geological Society of America Cordilleran/Rocky Mountain Convention, Las Vegas, Nevada, 19-21 March 2008.

Physics

The following were presented at the USU Graduate Student Research Symposium, Logan, Utah, April 2008.

Ariel Acebal. “Extending F10.7’s Time Resolution to Capture Solar Flare Phenomena.” Oral presentation. Garnered second place in Science Division.

— **FACULTY ACTIVITIES** —

Awards & Recognition

The Center for Atmospheric & Space Sciences

Jan J. Sojka was elected to serve as President-Elect of the Space Physics and Aeronomy Section of the American Geophysical Union. His term starts 1 July 2008.

Faculty Grants

Biology

James Pitts and Carol vonDohlen
National Science Foundation
1 February 2008 - 31 January 2010—\$200,000
“The Evolution of Parasocially and Nesting Behaviors in Pompilidae (Hymenoptera)”

Kent Evans
Utah Dept of Ag and Food
1 July 2007 - 31 March 2008—\$4,000
“Sudden Oak Death Diagnostics in Utah”

Don Roberts
Utah Dept of Ag and Food
1 January 2008 - 31 December 2008—\$140,000
“Biological Control of Mormon Crickets in Utah”

Jon Takemoto
Baicor, LLC
1 January 2008 - 31 December 2010—\$203,032
“Novel Agropesticides”

Erin Hodgson
Utah Dept of Ag., Plant Industry
1 January 2008 - 31 December 2008—\$113,047
“Utah Plant Pest Survey and Detection: CORE Project”

Erin Hodgson and James Pitts
Utah Dept of Ag., Plant Industry
1 January 2008 - 31 December 2008—\$12,450
“Imported Fire Ant Survey”

Computer Science

Minghui Jiang
National Science Foundation
1 March 2008 - 28 February 2011—\$208,090
“Predicting RNA Secondary Structures with Pseudoknots: 2-Interval Graph and 3D Triangle Lattice”

Scott Cannon
Microsat Systems
1 August 2007 - 30 June 2008—\$99,465
“Software Support for AFRL Responsive Space Laboratory”

Geology

James Evans and Susanne Janecke
USC/SCEC
7 February 2007 - 31 January 2012—\$33,000
“Return to Cajon: Analysis of Deformation Mechanisms”

Joel Pederson and Gary O’Brien
USDOI/BOR
29 January 2008 - 30 March 2009—\$300,000
“Fiscal Year 2008 Treatment Plan for Historic Properties in the Glen Canyon Recreation Area and Grand Canyon National Park”

James P. Evans

RPSEA (Research Partnership to Secure Energy for America)
2008—\$180,000

This grant is to investigate the nature of rock fracture in gas-producing sandstones of the Mesa Verde group.

James P. Evans

National Science Foundation

1 June 2007 to 31 May 2009—\$98,777.

“Collaborative Research: Influence of Structure, Composition and Fluid-Rock Chemistry on Mode of Slip in the San Andreas Fault Zone at SAFOD.”

Thomas E. Lachmar

Cache County Corporation

Original start date extended to 31 December 2008—\$8,000.

“Discharge Monitoring and Chemical Characterizations of Springs in East-Central Cache Valley, Utah.”

Joel L. Pederson

U.S. Department of Interior/Bureau of Reclamation

29 January 2008 to 30 March 2013—\$2,297,474

“Treatment Plan for Historic Properties in the Glen Canyon Recreation Area and Grand Canyon National Park.”

Joel L. Pederson

National Science Foundation

1 April 2008 to 31 March 2009—\$70,957

“Technician Support: New Utah State University Luminescence Geochronology Laboratory.”

Tammy M. Rittenour

National Science Foundation

1 September 2007 to 31 August 2010

“Collaborative Research: Assessing Climatic Controls on Intervals of Stability and Deposition on Alluvial Fans.”

Mathematics & Statistics**James Cangelosi**

Utah State Office of Education

1 March 2007 - 28 February 2008—\$120,000

“Utah Mathematics Endorsement Project (UMEP)”

Physics**Eric Held**

Department of Energy

15 February 2008 - 14 February 2011—\$75,001

“Center of Extended Magnetohydrodynamic Modeling”

David Peak and Aravind Dasu

Micron Corporation, through the USU Micron Research Center

2008—\$41,500

“Biomimetic Cellular Computing and Validation on FPGAs”

J.R. Dennison

NASA

4 April 2008 - 3 April 2009—\$189,047

“Resistivity and Electron Emission Studies Investigations of Insulation Materials for the James Webb Space Telescope-Phase III”

Jan Sojka

Dugway Proving Ground

12 March 2008 - 11 March 2013—\$5,957

“US Army –DPG Student Infrastructure Support”

The Center for Atmospheric & Space Sciences**Robert Schunk, Ludger Scherliess, and Donald Thompson**

Naval Research Laboratory

28 April 2008—27 January 2009—\$186,000

“USU-GAIM: Maintenance and Upgrade of the Gauss-Markov Model”

Faculty Presentations & Related Professional Activities**Chemistry & Biochemistry**

Alvan C. Hengge, Tiago A. Brandao, Sara A. Huefner and Sean J. Johnson presented a poster titled “Differential Mutational Effects on Conformational Changes During Catalysis by Protein-Tyrosine Phosphatases” at the Gordon Conference on Isotopes in Biological and Chemical Sciences, Ventura, CA, 17-22 February 2008.

Steve Scheiner presented an invited talk titled “An Owner’s Manual: How to Move Your Proton” at the conference on Diffusion, Solvation, and Transport of Protons in Complex and Biological Systems, Eilat, Israel, 13-17 January 2008.

Stephen Bialkowski presented an invited talk titled “Models and Measurements for Photothermal Spectrometry of Collected Aerosols” at the Gordon Research Conference on Photoacoustic and Photothermal Phenomena in Ventura, California, 10-15 February 2008.

Computer Science

Brian J. Norman** and **Chad D. Mano** presented a talk titled “Tradeoffs in Random Peer-to-Peer Botnet Model Design” at the Proceedings of Computer Security Conference in Myrtle Beach, South Carolina, 16-18 April 2008.

Geology

Anthony R. Lowry gave an invited talk titled “Slip Processes on Earthquake Faults: Some Recent Insights from Earth Deformation Measurements” at the Department of Physics' Colloquium series at Utah State University, Logan, Utah, 26 February 2008.

Anthony R. Lowry gave an invited talk titled “Mass Loading and Rock Flow: New Insights from Isostatic Analysis” at the Department of Geological Sciences Smith Lecture series at University of Michigan in Ann Arbor, Michigan, 7 March 2008.

Henry Berglund, Anne Sheehan, Walter Szeliga, Mousumi Roy, R. Steve Nerem, Anthony R. Lowry and **Frederick Blume** presented a poster titled “Rio Grande Rift GPS Measurements 2006-2008” at the UNAVCO Science Workshop in Boulder, Colorado, 11-13 March 2008.

Juan C. Afonso, Marta Pérez-Gussinyé, Javier Fullea, Sergio Zlotnik, Manel Fernández, and **Anthony R. Lowry** presented an invited talk titled “The Nature of the Lithospheric and Sub-Lithospheric Upper Mantle: Recent Views from Interdisciplinary Studies and Their Limitations” at the European Geosciences Union General Assembly in Vienna, Austria, 13–18 April 2008.

James Evans will be a Session Chair and Co-convenor at the AAPG Hedberg Conference on “The Geologic Occurrence and Hydraulic Significance of Fractures in Reservoirs” at the Casper Petroleum Club in Casper, Wyoming, 14-18 July 2008.

James Evans has been appointed as the new *Lithosphere* co-editor by the Geological Society of America Council for a four-year term beginning April 2008. *Lithosphere*, a new journal to be launched in early 2009, will focus on tectonic processes at all scales that affect the crust and upper mantle, from the surface to the base of the lithosphere, and will highlight research that addresses how the surface, crust, and mantle interact to shape the physical and chemical evolution of the lithosphere at all spatial and temporal scales.

Physics

Tom Wilkerson gave a talk titled “Ultraviolet Holographic Telescope for TWiLiTE,” at the NOAA/NASA Wind Lidar Working Group Meeting in Monterey, CA, 5-8, February 2008. Authors from USU, SDL, NASA-Goddard, and SESI: **J. Hancock, J. Swasey, A. Shelley, G. Schwemmer, C. Marx, S. Schicker, G. Bowen,** and **T. Wilkerson.**

T.C. Shen. “An Epitaxial “Approach to 3D Nanoscale Electronics in Silicon.” Oral presentation at Engineering Leading Edge Program at Micron Technology,” Boise, Idaho, 4 April 2008.

Tom Wilkerson. “A Symposium on Atomic Physics: A Tribute to Walter Johnson.” Invited talk at Physics Department, Notre Dame University, 4-5 April 2008.

The Center for Atmospheric & Space Sciences

Robert W. Schunk, Larry C. Gardner, Ludger Scherliess, Donald C. Thompson, and **Jan J. Sojka** gave a talk titled "Seamless Ocean-Atmosphere Model - Effect of Upward Propagating Waves on the Thermosphere and Ionosphere" at the 88th Annual Meeting of the American Meteorological Society, New Orleans, Louisiana, 18-26 January 2008.

Narayan P. Chapagain, Michael J. Taylor, Dominique Pautet, David C. Fritts, Thomas Dautermann,** and **Jeniffer S. Haase** presented a poster titled “Properties and Propagation of Plasma Bubbles Observed over Brazil During the SpeadFEx Campaign, 2005” at the Space Weather Workshop held in Boulder, Colorado, 29 April - 2 May 2008.

Robert W. Schunk, Ludger Scherliess, Donald C. Thompson, Jan J. Sojka, and **Lie Zhu** presented a talk titled “Data Assimilation Models for Ionospheric Specifications and Forecasts” at the Space Weather Workshop held in Boulder, Colorado, 29 April - 2 May 2008.

Jan J. Sojka presented an invited talk titled “Solar Minimum Ionospheric Variability at High Latitudes: Challenges for our Models” at the Fourteenth Annual RF Ionospheric Interactions Workshop held in Boulder, Colorado, 22-25 April 2008.

Chemistry & Biochemistry

Oluwatosin Dada**, **Matthew R. Jorgensen***, and **Stephen E. Bialkowski**. 2007. Continuous Laser-Excited Photothermal Spectrometry of CdS_xSe_{1-x} Doped Glasses. *Applied Spectroscopy* 61(12):1373-1378.

Computer Science

Chad D. Mano, **Andrew Blach**, **Qi Liao**, **Yingxin Jiang**, **David A. Cieslak**, **David C. Salyers**, **Aaron Striegel**. 2008. RIPPS: Rogue Identifying Packet Payload Slicer Detecting Unauthorized Wireless Hosts Through Network Traffic Conditioning. *ACM Transactions on Information and System Security* 11(2):1-23.

Geology

Marta Pérez-Gussinyé, **Anthony R. Lowry**, **Jason Phipps Morgan**, and **Andres Tassara**. 2008. Effective Elastic Thickness Variations Along the Andean Margin and Their Relationship to Subduction Geometry. *Geochemistry Geophysics Geosystems* 9:Q02003.

Barry B Hanan, **John W. Shervais** and **Scott K. Vetter**. 2008. Yellowstone Plume-Continental Lithosphere Interaction Beneath the Snake River Plain. *Geology* 36:51-54.

Marlon M. Jean**, **John W. Shervais**, **Samuel B. Mukasa**, and **Sung Hi Choi**. 2008. In-situ LA-ICP-MS Analysis of Pyroxene in the Peridotite of the Coast Range Ophiolite, California. *Geological Society of America Abstracts with Programs* 40:34 no. 1.

J. D. Kirkpatrick, **Z. K. Shipton**, **J. P. Evans**, **S. Micklethwaite**, **S. J. Lim**, and **P. McKillop**. 2008. Strike-slip Fault Terminations at Seismogenic Depths: the Structure and Kinematics of the Glacier Lakes Fault, Sierra Nevada United States. *Journal of Geophysical Research* 113, B04304, doi:10.1029/2007JB005311.

Mathematics & Statistics

Samson Y. Gebreab, **Robert R. Gillies**, **Ronald G. Munger**, **Juergen Symanzik**. 2008. Visualization and Interpretation of Birth Defects Data Using Linked Micromap Plots, Birth Defects Research Part A. *Clinical and Molecular Teratology* 82:110–119.

Juergen Symanzik, **Daniel B. Carr**. 2008. Interactive Linked Micromap Plots for the Display of Geographically Referenced Statistical Data. *Chen, C., Haerdle, W., Unwin, A. (Eds.). Handbook of Data Visualization, Springer, Berlin/Heidelberg*. 267–294.

Z.Q. Wang, and **F. Van Heerden**. 2008. A Class of Anisotropic Nonlinear Elliptic Equations. *Communications on Pure and Applied Analysis*. 7:149-162.

Z.Q. Wang and **J.Q. Liu**. 2008. Symmetric Solutions to a Modified Nonlinear Schrodinger Equation. *Nonlinearity*. 21:121-133.

Mevin B. Hooten and **Christopher K. Wikle**. 2008. A Hierarchical Bayesian Non-linear Spatio-temporal Model for the Spread of Invasive Species with Application to the Eurasian Collared-Dove. *Environmental and Ecological Statistics* 15(1):59-70.

The Center for Atmospheric & Space Sciences

John W. Jensen** and **Bela G. Fejer**. 2008. Longitudinal Dependence of Middle and Low Latitude Zonal Plasma Drifts Measured by DE-2. *Annales Geophysicae* 25:2551-2559.

Ludger Scherliess, **Donald C. Thompson** and **Robert W. Schunk**. 2008. Longitudinal Variability of Low-Latitude Total Electron Content: Tidal Influences. *Journal of Geophysical Research* 112:A01311, doi:10.1029/2007JA012480.

Geonhwa Jee, A. G. Burns, W. Wang, Stan C. Solomon, **Robert W. Schunk**, **Ludger Scherliess**, **Donald C. Thompson**, **Jan J. Sojka**, and **Lie Zhu**. 2008. Driving the TING Model with GAIM Electron Densities: Ionospheric Effects of the Thermosphere. *Journal of Geophysical Research* 113:A03305, doi:10.1029/2007JA012580.

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