



Science Scene

Research Report

February 2007 to April 2007

A Publication of the College of Science, Utah State University

—The Dean’s Corner—

The primary purpose of Science Scene is to convey the research accomplishments of our faculty and students in the College of Science to the broader University community. Please report your successes in research to your department in sufficient detail so that the information on publications, presentations, and/or external funding reported in Science Scene is timely, thorough and accurate. Thank you for your cooperation in this effort.

At our recent College of Science awards ceremony on April 25, we introduced our third group of Willard L. Eccles Undergraduate Research Fellows as well as the recent recipients of College of Science Mini-grants. These programs (and their financial incentives) have been very successful in encouraging our undergraduates to pursue research with a faculty mentor. It has certainly contributed to the success of our undergraduates, such as helping them get into graduate or professional schools, but more importantly, it has given them critical insights into the processes of scientific investigation and provided them with hands-on experiences that they would otherwise not acquire. At the same time, some of the success of these programs should be attributed to the faculty who have agreed to be the research mentors. Although training and directing undergraduates can be time consuming, there is clearly a return on this investment. It is very rewarding to watch these students learn lab techniques and procedures and then follow through as effective collaborators in a research project. This becomes the working model for our college slogan: “When students and faculty learn together,...discovery follows.”

This will be my last contribution to Science Scene as Dean. Later this summer, I will return to the Geology Department and resume teaching. I would like to take this opportunity to thank you, the faculty and staff of the College of Science, for all that you do to make our college so successful in teaching and research. You should take great pride in all that has been collectively accomplished. I anticipate even greater successes as we proceed under the leadership of our new dean, Dr. Mary Hubbard.

— COLLEGE OF SCIENCE CONTRACT & GRANT ACTIVITY —

Amounts (# of proposals)	February 2007	March 2007	Cumulative Totals for FY06-07
Proposals Submitted	\$8,126,597 (25)	\$2,432,291 (11)	\$56,633,385 (148)
Awards Received	\$103,346 (2)	\$816,880 (9)	\$4,593,300 (66)



Biology

Sherry M. Baker – Daryll Dewald, Faculty Mentor
“Immunofluorescence of Sac9 in *Arabidopsis thaliana*.”

Andrew Burgon – David York and MeiJung Park, Faculty Mentors (Center for Advanced Nutrition)
“Entrostatin Regulation of Protein Translocation in HepG2 Liver Cells.”

Matthew Chambers – Jon Takemoto, Faculty Mentor
“Effect of SP25A and D-Cycloserine Combination on Gram-Positive Bacteria Inhibition.”

Chad Dallan – Joseph K.-K. Li, Faculty Mentor
“The Differential Effects of RNAi on Individual Blue Tongue Virus Genes.”

Chemistry & Biochemistry

Scott Johnson – Joan M. Hevel, Faculty Mentor
“Investigating the Methyltransferase Activity of PRMT2.”

Geology

Shannon Babb and Lysie Daley – Carol Dehler, Faculty Mentor
“Petrographic Mapping of the Sandstones from the Neoproterozoic Jesse Ewing Canyon Formation Uinta Mountains, UT.”

Melissa Jackson – Joel Pederson, Faculty Mentor
“Using Luminescence Geochronology to Establish Age-control and Environmental Context for a Paleoindian Archaeology Site.”

Physics

Jennifer Albreetsen – J. R. Dennison, Faculty Mentor
“Investigating the Photo-Yield of Insulators for Space and Terrestrial Application.”

Steven Hart – J. R. Dennison, Faculty Mentor
“Electric Field Induced Hopping Conductivity and Polarization in Hytrel.”

Benson Price – T. C. Shen, Faculty Mentor
“Photodesorption of Hydrogen from H/Si(100) at 193 nm.”



The College of Science Student and Faculty Honors

Fall 2006 Valedictorian—**Carli C. Potter**—Mathematics & Statistics
Spring 2007 Valedictorian—**Melody R. Anderson**—Biology
Scholar of the Year—**Elizabeth A. Lund**—Chemistry & Biochemistry
Undergraduate Student Researcher of the Year—**Jan Marie Andersen**—Physics
Graduate Student Researcher PhD—**Justin E. Heavilin**—Mathematics & Statistics
Graduate Student Teacher of the Year—**Matthew Bailey**—Physics
College of Science Undergraduate Research Mentor of the Year—**Joseph Li**—Biology
College of Science Researcher of the Year—**Piotr Kokoszka**—Mathematics & Statistics
College of Science Teacher of the Year—**Lance Seefeldt**—Chemistry & Biochemistry
College of Science Advisor of the Year—**Scott Ensign**—Chemistry & Biochemistry

— College of Science Undergraduate
Research Minigrants 2007-2008 —

Biology

Michael Larsen – E.W. Ted Evans, Faculty Mentor

“Symbionts Role in Preventing Predation.”

Erik Sibbernsen – Keith Mott, Faculty Mentor

“Stomatal Response.”

Adam Thompson – Diane Alston, Faculty Mentor

“Comparative Effects of Varied Diets on Fecundity of Pest Weevil Plum Curculio (*Contotrachelus nenuphar*).”

Chemistry & Biochemistry

Alma Jones – Lance Seefeldt, Faculty Mentor

“Studying the Dark-Operative Protochlorophyllide System for Insights into Nitrogenase.”

Computer Science

Gregory Allan – Chad Mano, Faculty Mentor

“Peer-to-Peer Botnet Simulation and Defense.”

Geology

Michael Keller – Joel Pederson, Faculty Mentor

“Logan Bluff Landslide.”

Mathematics & Statistics

Andrew Pound – Daniel Coster, Faculty Mentor

“Estimation of Amplitudes and Phases of Multiple Atmospheric Waves: A Simulation Study.”

Merissa Swainston – Kady Schneider, Faculty Mentor

“Computer-based Concept Tutorials in Statistics (CTIS).”

Physics

Douglas Ball – Haeyeon Yang, Faculty Mentor

“STM Nanostructuring with Nanodot Formations.”

Nicholas Lambert – Haeyeon Yang, Faculty Mentor

“Scanning Tunneling Spectroscopy on Nanodots and Quatum Dot Chains.”

Jarron Lembke – Vincent Wickwar, Faculty Mentor

“Atmospheric Studies using a Lidar Telescope.”

— Willard L. Eccles Undergraduate
Fellowships 2007-2008 —

Biology

Nathaly Carranza – Jon Takemoto, Faculty Mentor

“Growth Parameters for Antifungal Cyclic Lipononadepsipeptide Production.”

Jake Jones – Frank Messina, Faculty Mentor

“Mechanisms of Adaptation to New Legume Hosts by Seed Beetles.”

Chemistry & Biochemistry

Jennifer Fisch – Joan Hevel, Faculty Mentor

“Generating an ADMA-Specific RNA Aptamer for Quantifying ADMA.”

Bradley Hintze – Sean Johnson, Faculty Mentor

“Structural and Genomic Analysis of a Nuclear RNA Degradation Pathway.”

Computer Science

Arthur Mahoney – Dan Watson, Faculty Mentor

“Parallel Path Planning in Undirected and Unweighted Graphs.”

Sunghun Park – Xiaojun Qi, Faculty Mentor

“Frontal or Near-Frontal Face Recognition.”

Geology

Tamara Jeppson – Jim Evans, Faculty Mentor

“Interpretation of Geophysical Well Log Data from the San Andreas Fault Observatory at Depth.”

Mathematics & Statistics

Shelley Taylor – John Stevens, Faculty Mentor

“Incorporating Measurement Error into Weights for Distance Measures.”

Physics

Cade Perkins – T.C. Shen, Faculty Mentor

“Creating Boron Delta Layers in Silicon.”

Jodie Tvedtnes – Mike Taylor, Faculty Mentor

“Noctilucent Cloud Measurements in Coordination with the AIM Satellite Mission.”

New Faculty Research Grants 2007 - 2008

CURI Grants 2007 - 2008

S. K. Morgan Ernest, Biology-\$15,000

“Examining the Long-Term Stability of the Rank-Abundance Distribution.”

Sean Johnson, Chemistry & Biochemistry-\$15,000

“Structural Studies of TRAMP.”

Anthony Lowry, Geology-\$14,968

“Estimating Lithospheric Rheology from Isostatic Analysis of Geophysical Data.”

Chad Mano, Computer Science-\$15,000

“New Approaches in Botnet Identification and Monitoring.”

S. Mukhopadhyay, Computer Science-\$14,979

“Formal Techniques and Tools for Reliable Service-Oriented Computing.”

Kady Schneider, Mathematics & Statistics-\$14,974

“CTIS: Concept Tutorials in Statistics.”

John R. Stevens, Mathematics & Statistics-\$14,984

“Tools for Hierarchical Dependence in Meta-Analysis of Gene Expression Studies.”

Erin Hodgson, Biology-\$22,990

“Developing a Bioassay to Evaluate Alfalfa Weevil Resistance in Alfalfa.”

MieJung Park, Biology and the Center for Advanced Nutrition-\$31,065

“Conjugated Linoleic Acid Metabolism in Bovine Adipose and Mammary Cells.”

Brett Barney, Chemistry & Biochemistry-\$28,006

“An Approach to Microbial H₂ Generation: Specific Interactions between a Hydrogenase and its Electron Donor in the Bacterium *Shewanella sp.*”

Changhui Yan, Computer Science-\$28,583

“Investigation of Molecular Interactions in Breast Cancer.”

— STUDENT ACTIVITIES —

Student Awards, Recognition & Grants

undergraduate*; graduate**

Biology

Kevin Williams** was awarded 1st place (with a cash prize) in the Ph.D. poster competition at the 91st Entomological Society of America’s Pacific Branch Meeting in Portland, Oregon, 25-28 March 2007.

Melody Rose Anderson* – Science Valedictorian – is one of 57 recipients nationwide of the Phi Kappa Phi Fellowship. Ted Evans is her faculty mentor.

Sherry Baker* received an American Heart Association Undergraduate Research Fellowship for Summer 2007. Daryll DeWald is her faculty mentor.

Physics

Jennifer Albretsen won a Barry M. Goldwater Scholarship and **Jodie Tvedtnes** received honorable mention.

Jan Marie Andersen received a 2007-2008 Fulbright U.S. Student Scholarship to study physics, beginning in the fall, at the University of Copenhagen’s Niels Bohr Institute.

Student Presentations

undergraduate*; graduate**

Biology

Ryan P. O’Donnell** presented a poster titled “Erroneous Historical Records of Climbing Salamanders (*Genus Aneides*) in Washington State, U.S.A.” at the joint annual meeting of the Society for Northwestern Vertebrate Biology and the Northwest Scientific Association held in Victoria, British Columbia, Canada, 21-24 February 2007.

Casey H. Richart, Marc P. Hayes, **Ryan P. O'Donnell****, Kevin Young, Rod Crawford, and Chris Maynard presented an oral presentation titled "Diet of Terrestrial Forest-Dwelling Amphibians in Washington" at the joint annual meeting of the Society for Northwestern Vertebrate Biology and the Northwest Scientific Association held in Victoria, British Columbia, Canada, 21-24 February 2007.

The following presentations were made at the 10th Annual Graduate Research Symposium, Utah State University, Logan, Utah, 4 April 2007:

Amanda Bakian**. "Finding Biological Relevance in the Home Range Concept: The Application of a Geostatistical Approach to Analyzing and Predicting Animal Space Use."

Ryan O'Donnell**. "Erroneous Historical Records of Climbing Salamanders (*Genus Aneides*) from Washington State, U.S.A."

Cory Vorel**. "The Proboscis Extension Reflex in Hymenopterans of Different Social Levels."

Ryan Jackson**, **Chad Dallan***, **Daniel Child***, **Janette Starks***, **Melissa Garner*** and **Joseph Li**. "The Stability of Bluetongue Virus mRNAs in the Presence of Antiviral Agents."

Chemistry

Dmitry Yu. Zubarev** presented a talk titled "Breakdown of the Spherical Symmetry in Semiconducting Sub-Nanoclusters" at the Club Med seminar, Department of Chemistry, Yale University, 16 November 2006.

Student Publications

Marjorie D. Matocq, Quinn R. Shurtliff, **Chris R. Feldman****. 2007. Phylogenetics of the Woodrat Genus *Neotoma* (*Rodentia: Muridae*): Implications for the Evolution of Phenotypic Variation in Male External Genitalia. *Molecular Phylogenetics and Evolution* 42:637-652.

Allen W. Spaulding**. 2007. Rapid Courtship Evolution in Grouse (*Tetraonidae*): Contrasting Patterns of Acceleration between the Eurasian and North American Polygynous Clades. *Proc. R. Soc. Biol. Sci. Ser. B* 274:1079-1086.

— STAFF ACTIVITIES —

Staff Presentations

Michael B. Piep made a presentation titled "The Genus *Flammulina* in Utah" at the Utah Mushroom Society, Salt Lake City, Utah, 12 February 2007.

Michael B. Piep made a presentation titled "Hollywood vs. Reality: Triffids Exposed" for the Utah Museum of Natural History's Science Movie Night, featuring "Day of the Triffids," Salt Lake City, Utah, 6 March 2007.

— FACULTY ACTIVITIES —

Awards & Recognition

Biology

The Herbarium's (Director, Mary Barkworth) website (<http://herbarium.usu.edu/fungi/FunFacts/factindx.htm>) designed by Bob Fogel received the ClickSchooling Award on the homefires.com website (<http://www.homefires.com/free.html>). The site was sent to approximately 8,000 ClickSchooling subscribers encouraging them to visit the Herbarium site to learn more about fungi.

Diane G. Alston received the Award for Excellence in Integrated Pest Management at the 91st Entomological Society of America's Pacific Branch Meeting in Portland, Oregon, 25-28 March 2007.

Mary Barkworth has completed the "North American Grasses." Volumes 24 and 25.

Computer Science

Vicki Allan was selected to serve as PhD Forum Co-Chair for the Grace Hopper Conference to be held in Orlando, Florida, 2007. Female PhD students are invited to present their research in this forum. See <http://gracehopper.org/2007/>.

Faculty Grants

Biology

Jon Takemoto

Jeneil Biotech, Inc.

1 September 2006 to 31 August 2007-\$18,500

"Production and Application of Syringomycin-Based Agrofungicides."

Jon Takemoto

Frontier Scientific

1 January 2007 to 31 December 2007-\$28,373

"Microbial Bile Pigments and Biliverdin."

Timothy Gilbertson

Department of Health and Human Services

1 April 2003 to 29 February 2008-\$236,178

"Taste Transduction and its Regulation."

Kimberly Sullivan

City of Seattle, City Light Department

19 January 2007 to 30 June 2009-\$78,900

"Clark's Nutcracker Habitat Use and Relative Abundance in the Cascade Range."

Edward Evans

USDOI Bureau of Land Management
22 May 2006 to 30 June 2011-\$17,213
“Biological Control of Noxious Weeds in Utah.”

Chemistry & Biochemistry**Tom Chang**

Department of Health and Human Services
01 March 2004 to 28 February 2009-\$108,587
“Novel Ribostamycins and SAR Study of their Ring III Aminosugar.”

Lance Seefeldt

Department of Health and Human Services
1 April 2004 to 31 March 2008-\$234,469
“Nitrogenase Mechanism.”

Scott Ensign

Department of Health and Human Services
1 December 2004 to 30 November 2008-\$46,381
“Microbial Metabolism of Aliphatic Alkenes, Epoxides, and Ketones.”

Alex Boldyrev

National Science Foundation
1 July 2007 to 30 June 2010-\$294,000
“Development of New Island Aromatic Fragment (IAF) Analysis for Deciphering Chemical Bonding in Clusters.”

Computer Science**Scott Cannon**

Mission Research Corporation
13 April 2005 to 31 May 2007-\$52,000
“Satellite Data Model Development.”

Seungjin Lim

Altiris
12 May 2006 to 11 May 2007-\$9,000
“Semantic String Matching.”

Robert Erbacher

Intellivis, Inc.
1 February 2007 to 31 May 2007-\$12,500
“Novel Interface Extensions to Visalert.”

Geology**Susanne Janecke**

United States Geological Survey
1 January 2006 to 30 June 2007-\$16,535
“Detecting Hidden, High-Slip Rate Faults: Southern San Jacinto Fault Zone, California.”

James Evans

Utah Geological Survey
11 December 2006 to 28 September 2007-\$11,720
“Analysis of Reservoir Properties of Faulted and Fractured Aeolian Thrust-Belt Reservoirs.”

James Evans

United States Geological Survey
1 March 2007 to 29 February 2008-\$63,642
“Earthquake Timing on the Southern Segments of the East Cache Fault Zone, Utah.”

Mathematics & Statistics**James Cangelosi**

State of Utah Office of Education
25 January 2007 to 30 June 2007-\$20,000
“Utah Mathematics Endorsement Project (UMEP).”

Russell Thompson

State of Utah Office of Education
2 January 2007 to 30 June 2007-\$50,200
“Revision of Mathematics Core Curriculum.”

Physics and The Center for Atmospheric & Space Sciences**Eric Held**

United States Department of Energy
15 December 2003 to 14 December 2007-\$82,057
“Advanced Closures for Numerical Simulations of Neoclassical Tearing Modes.”

J.R. Dennison

National Aeronautics and Space Administration
15 March 2006 to 14 September 2007-\$334,939
“Investigations of the Resistivity of Insulating Materials for the James Webb Space Telescope.”

Eric Held

United States Department of Energy
1 March 2005 to 28 February 2010-\$55,000
“Plasma Center for Computational Predictability.”

Mike Taylor

National Science Foundation
15 January 2005 to 31 December 2007-\$75,032
“Cedar Collaborative Research: Quantification of Gravity Wave Instability Dynamics and Mean Forcing Using MTM and Related Instrumentation at Alomar and Maui Malt.”

Mike Taylor

Hampton University
1 November 2004 to 30 September 2008-\$30,000
“Subcontract for Participation in Aim Mission Phase C/D/E.”

Robert Schunk

Northrop Grumman
24 January 2007 to 31 December 2007-\$21,289
“SEMS/SWAFS.”

Bela Fejer

National Science Foundation
1 April 2006 to 31 March 2008-\$124,001
“Radar Studies of the Low Latitude Disturbed Ionosphere.”

Robert Schunk

United States Office of Naval Research

01 October 2006 to 30 September 2009-\$165,000

“A Thermosphere-Ionosphere Data Assimilation Model Component for a Seamless Ocean-Atmosphere Model.”

Faculty Presentations & Related Professional Activities

undergraduate*; graduate**

Biology

Megan Kanaga**, **Michael Pfrender**, Ron Ryel and **Karen Mock**.

“Substantial Heritable Genetic Variation within Western Aspen Stands.” Evolutionary Change in Human-altered Environments: An International Summit. UCLA Institute of the Environment Conference, 8-10 February 2007.

The following talks were given at the Fifth International Symposium on “Ecological Genetics” in Leuven, Belgium, 5-7 February 2007:

John K. Colbourne, **Michael E. Pfrender**, and the rest of the Daphnia Genomics Consortium. “The Genome Sequence of Daphnia for Ecology and Evolutionary Studies.”

Michael E. Pfrender, **Debra L. Fisk****, **Leigh C. Latta IV****, and Roland A. Knapp. “Rapid Evolution in Response to Introduced Predators: Trait Divergence and Adaptive Plasticity.”

James Cane. “Pollinating Great Basin Forbs for Seed to Rehabilitate Western Rangelands.” Symposium presentation at the National Meeting of the Society for Rangeland Management, Reno, Nevada, 12-15 February 2007.

Uyen T. Lam*, **Janette Starks***, **Maggie Buccambuso****, **Ryan N. Jackson****, **Chad Dallan***, **Daniel Child***, **Melissa Garner***, and **Joseph K.-K. Li**. “Stability and Degradation of Bluetongue Viral mRNAs.” Utah Undergraduate Science Fair, University of Utah, Salt Lake City, Utah, 2 February 2007.

Uyen Lam*, **Karen Buccambuso****, **Janette Starks***, **Ryan Jackson****, **Chad Dallan***, **Daniel Child***, **Melissa Garner*** and **Joseph Li**. “Kinetic Analysis of Bluetongue Virus mRNAs by qRT-PCR.” Presented at the National Undergraduate Research Conference, San Dominican University, San Francisco, California, 12 April 2007.

Timothy A. Gilbertson presented “Looking Back While Facing Forward: My Journey to Logan” at the Inaugural Professor Lecture, Logan, Utah, 20 February 2007. The series, hosted by President Stan Albrecht and First Lady Joyce Albrecht, at their home, is coordinated by the Provost’s office to recognize the accomplishments of university faculty who have been promoted to full professor in the past year.

Mark P. Miller and E. Richard Vincent. “Rapid Natural Selection for Resistance to an Introduced Parasite of Rainbow Trout.” Oral presentation at the 13th Annual Whirling Disease Symposium held in Denver, Colorado, 12-13 February 2007.

Mark P. Miller and E. Richard Vincent. “Rapid Natural Selection in Response to an Introduced Parasite of Rainbow Trout: Preserving Genetic Diversity Matters in Changing Environments.” Poster presented at Evolutionary Change in Human Altered Environments: An International Summit held in Los Angeles, California, 8-10 February 2007.

Donald W. Roberts, **Edward W. Evans**, **Drauzio E. N. Rangel****, **Chad A. Keyser***, **Helen G. Bignayan**, Seth J. Dettermaier, Everton K. K. Fernandes, **Mark P. Miller**, Holly Suisse, Juanita B. Nandalochana, and **JoAnn Starks**. “Biological Control of Mormon Crickets in Utah.” Oral presentation at the Grasshopper/Mormon Cricket Decision and Action Committee Meeting of the Utah Department of Agriculture and Food in Salt Lake City, Utah, 8 February 2007.

Donald W. Roberts, **Edward W. Evans**, **Drauzio E. N. Rangel****, **Chad A. Keyser***, **Helen G. Bignayan**, Seth J. Dettermaier, Everton K. K. Fernandes, **Mark P. Miller**, Holly Suisse, Juanita B. Nandalochana, and **JoAnn Starks**. “Promise and Problems of Fungi as Biological Control Agents of Mormon Crickets.” Oral presentation at the National Grasshopper Management Board Annual Meeting in Reno, Nevada, 15-16 February 2007.

Joseph K.-K. Li presented “Potential Human Cancer Therapy with Oncolytic Sheep Viruses” in the Department of Life Sciences, Xiamen University, 8 March 2007.

Joseph K.-K. Li presented a poster titled “Poly-ICLC Significantly Reduces Virus Lung Titers in a SARC-CoV Mouse Model” at the 9th International Symposium on Respiratory Viral Infections, Hong Kong, 3-6 March 2007.

Mark P. Miller gave a tutorial that covered “Scientific Computing 101” at the Agricultural Computing Research & Education Services (ACRES) Symposium “Challenges and Opportunities for High Performance Computing in Agriculture and Life Sciences,” Utah State University, 26-27 March 2007.

Mark P. Miller presented “Simulating Large Scale Spatial Evolutionary Processes” at the Agricultural Computing Research & Education Services (ACRES) Symposium “Challenges and Opportunities for High Performance Computing in Agriculture and Life Sciences,” Utah State University, 26-27 March 2007.

The following posters were presented at the 91st Annual Meeting of the Entomological Society of America’s Pacific Branch Meeting in Portland, Oregon, 25-28 March 2007:

James Pitts, **Joseph Wilson****, and **Kevin Williams****. “Molecular Analysis of Nearctic Nocturnal Velvet Ant *Odontophotopsis Viereck (Hymenoptera: Mutillidae)*.”

Kevin A. Williams**, **Erik M. Pilgrim****, and **James P. Pitts**. “Synonymies and Sex Associations in the Velvet Ant Genus *Dasymutilla (Hymenoptera: Mutillidae)*.”

Joseph Wilson** and **James Pitts**. “Phylogeography of the Deserticolous Velvet Ant *Dilophotopsis Concolor (Hymenoptera: Mutillidae)*.”

Kevin Williams** and **James Pitts**. “Sex Association and Synonymy in Southwestern U.S. Species of *Dasyutilla* (*Hymenoptera: Mutillidae*).” 1st place in the Ph.D. Poster competition.

James P. Strange and **Joyce Knoblett**. “Microsatellite Loci for Conservation and Population Genetic Studies in North American *Bombus* Species (*Hymenoptera: Apidae*).”

James Cane. “Bee Pollination of Farmed Wildflowers for Habitat Restoration Seed.”

Diane G. Alston. “Contribution of Onion Thrips (*Thrips tabaci*) Egg Survival and Adult Dispersal to Populations on Onions.”

Chemistry & Biochemistry

The following posters were presented at the 232nd National American Chemical Society Meeting, San Francisco, CA, 10-14 September 2006.

Boris B. Averkiev** and **Alex I. Boldyrev**. “Photoelectron Spectroscopic and ab initio Theoretical Study of Planar Nitrogen Doped Aluminum Clusters Al_3N^- , Al_4N^- , and Al_5N^- .”

Dmitry Yu. Zubarev** and **Alexander I. Boldyrev**. “Possibility of Novel Gold-boron Compounds.”

Lisa M. Berreau presented an invited talk titled “Dioxygen Reactivity of Ni(II) Cis-Beta-Keto-Enolate Complexes” at the Inorganic Reaction Mechanisms Gordon Research Conference, Ventura, CA, 18-23 February 2007.

Alexander I. Boldyrev presented an invited talk titled “Structure and Bonding in All-Boron Clusters – Potential New Ligands and Building Blocks in Chemistry International Workshop on Clusters – A Bridge Across Disciplines”, Jekyll Island, Georgia, 16-20 December 2006.

Computer Science

Stephen Clyde, S. Salkowitz, and E. Wild made a presentation titled “Unique Records Portfolio—a PHIN-Usable Guide for Identifying and Resolving Duplicate Records in Integrated Person-Centric Systems” at the Public Health Information Network Conference, Atlanta, Georgia, 27 September 2006.

Supratik Mukhopadhyay made a presentation titled “Intelligent Co-ordination of Nano-sensors and Actuators” at the Nano-Utah Conference, Logan, Utah, 5 October 2006.

Geology

James P. Evans was co-convenor and co-organizer of the Southern California Earthquake Center Workshop on Earthquake Mechanics and Possible Shallow Drilling Research Projects, Palm Springs, California, 10 September 2006.

The following papers were presented at the American Geophysical Union meeting in San Francisco, California, 11-15 December 2006:

J.G. Solum, **J.P. Evans**, S. Hickman, D. Lockner, D. Moore, C. Morrow, D. Kirschner, J. Chester, F. Chester, B. van der Pluijm, and A. Schleicher. “Characterization of Fault Rock Compositions, Alteration Mineral Assemblages, and Preliminary Implications for Fluid-Rock Interaction in the San Andreas Fault System at the San Andreas Fault Observatory at Depth (SAFOD).”

R.J. Dorsey, B.A. Housen, **S. Janecke**, K. McDougall, M. Fanning, A. Fluette, G.J. Axen, and C.R. Shirvell. “Chronostratigraphy of the Fish Creek-Vallecito Basin, SW Salton Trough: A High-fidelity Record of Slip on the West Salton Detachment Fault and Subsidence in its Upper Plate.”

D. Kirschner, **J.P. Evans**, J. Chester, F. Chester, J. Garver, J. Solum, S. Hickman, and D. Moore. “Results of Elemental, Stable Isotope, Organic Matter, and Fission-track Analyses of SAFOD Drill-hole Cuttings and Core Material.”

John Puchakayala, **Anthony R. Lowry**, Roger Bilham, Sumitro Sen, T. Sharma, and Robert Smalley. (Poster). “Post-seismic Deformation of Andaman Islands since the 2004 Earthquake.”

G. J. Axen, **S. Janecke**, **A. Steely****, C. Shirvell, A. Fluette, M. Kairouz, B. Housen, D. Stockli, and R. Dorsey. “The West Salton Detachment Fault, Salton Trough, California: A Primary Low-angle Normal Fault in an Evolving Dextral Wrench Zone.”

Marta Perez-Gussinye, **Anthony R. Lowry**, Anthony B. Watts, and Jason Phipps Morgan. (Poster). “Tracing Lithospheric Structure Using Flexural Rigidity in South America: Implications for Intra-continental Deformation and Subduction Geometry.”

S.K. Vetter, S.A. Johnston, **J. Shervais**, and B. Hanan. “Geochemistry of Central Snake River Plain Basalts From Camas Prairie to Glenns Ferry, Southern Idaho.”

B.A. Housen, R.J. Dorsey, **S. Janecke**, and G.J. Axen. “Evolution of Rotations in the Fish Creek Vallecito Basin, Western Salton Trough, California.”

Simon L. Klemperer, Ronald L. Bruhn, Elizabeth L. Miller, **Anthony R. Lowry**, Robert B. Smith, Derek Lerch, Ewenet Gashawbeza, Joseph Colgan, and Katie Keranen. (Poster). “The Basin-and-Range Province (BRP): a Key GeoFrame Transect in Progress.”

C.N. Callahan, M. Roy, and **J.L. Pederson**. “Modeled Flexural Response to Erosion in the Colorado Plateau Implications for Laramide and Post-Laramide Rock Uplift Processes.”

Anthony R. Lowry, Robert B. Smith, and Mark E. Tamisiea. “Gleaning Rheology from Lithospheric Flexural Strength.”

K. Springer*, **J.P. Evans**, D. Kirschner, and **P.T. Kolesar**. "Relations Between Elevation and Stable Isotope Composition of Newly Fallen Snow in the Northern Wasatch Mountain Range of Utah."

The following papers were presented at the 2007 Earthscope National Meeting, Monterey, California, 27-30 March 2007:

Anthony R. Lowry, Anne F. Sheehan, Mousumi Roy, R. Steven Nerem, Monica Guerra and Amy Luther. "A Multidisciplinary Investigation of Rio Grande Rift Deformation."

S.D. Draper**, **J.P. Evans**, L.B. Thompson, **K.K. Bradbury****, and **D.C. Barton***. "Petrologic, Structural, and Tectonic Analysis of the Rocks Southwest of the San Andreas Fault in the SAFOD Borehole."

S.D. Draper**, **J.P. Evans**, and **K.K. Bradbury****. "Structural Analysis of San Andreas Fault in the SAFOD Borehole."

James P. Evans presented a talk titled "Deformation, Fluid-rock Interactions, and Chemical Alteration in Fault Zones from the Surface to 10 km+ Depth: The Links Between Earthquakes, Geochemistry, and Structural Geology" as the Smith Distinguished Lecturer, Department of Geosciences, University of Michigan, Ann Arbor, MI, 4 Nov 2006.

Mathematics & Statistics

Peg Howland presented a talk titled "Exploiting Factor Analysis Approximations in Dimension Reduction" at the Text Mining Workshop, Seventh SIAM International Conference on Data Mining, Minneapolis, Minnesota, 28 April 2007.

David E. Brown presented a talk titled "Tolerance, Probe Interval, and Interval k-Graphs: Capitalizing on their Similarities (and Differences)" at the Southeastern International Conference on Graph Theory Combinatorics and Computing, Boca Raton, Florida, 8 March 2007.

David E. Brown and **Jim S. Cangelosi** presented a talk titled "What is (Discrete) Mathematics?" at the Alta High School Math Club meeting, Sandy, Utah, 4 May 2007.

David E. Brown and **Jim S. Cangelosi** presented a talk titled "A High School-Level Discrete Math Class" at the Utah State Board of Education Curriculum Development Workshop, Salt Lake City, Utah, 9 March 2008.

Mevin B. Hooten presented an invited talk titled "Binary Spatio-Temporal Processes for Modeling Spreading Phenomena" at the Eastern North American Region of the International Biometrics Society Meeting in Atlanta, Georgia, 13 March 2007.

Mevin B. Hooten presented an invited talk titled "Nonlinear Process Specifications in Hierarchical Spatio-Temporal Models" at the BYU Department of Statistics Seminar Series in Provo, Utah, 27 March 2007.

Mevin B. Hooten presented an invited talk titled "The State of Spatio-Temporal Statistical Modeling in Ecology" at the US International Association for Landscape Ecology Meeting in Tuscon, Arizona, 10 April 2007.

Mevin B. Hooten presented a contributed talk titled "Characterizing Invasions with Hierarchical Rule-Based Systems" at the University of Arkansas, Department of Mathematics Spring Lecture Series in Fayetteville, Arkansas, 13 April 2007.

Physics and The Center for Atmospheric & Space Sciences

T. Wilkerson, **J.Hancock**, **J. Swasey**, and **A. Shelley** presented a talk titled "Critical Design Review for TWiLiTE Scanning Telescope, a NASA Instrument Incubator Program" at the Space Dynamics Laboratory, Logan, Utah, 12 February, 2007.

T.-C. Shen presented a talk titled "Interaction of Phosphine with Si(111)-7x7 Surfaces: Adsorption, Desorption and P-segregation" at the American Physical Society March meeting (co-author **Jeong-Young Ji**), Denver, Colorado, 6 March 2007.

Stephen Robinson presented a talk titled "Low-temperature Transport in Ga-implanted wires in Si" at the American Physical Society March meeting (co-author **T.-C. Shen**, John R. Tucker, Thomas Schenkel), Denver, Colorado, 7 March 2007.

S. R. Hart*, **J. Brunson****, and **J. R. Dennison** presented a talk titled "Electric-Field-Induced Hopping Conductivity in Polymers" at the American Physical Society March Meeting, Denver, Colorado, 5-9 March 2007. Also published in the Bulletin of American Physical Society 52(1) Part II (2007).

Timothy E. Doyle presented a talk titled "Simulation of Ultrasonic Scattering at the Cellular Level: New Tools for Disease Detection and Treatment" Utah Center for Advanced Imaging Research Seminar, University of Utah Medical Center, Salt Lake City, Utah, 8 March 2007.

Timothy E. Doyle presented a talk titled "Simulation of Ultrasonic Scattering at the Cellular Level: New Tools for Disease Detection and Treatment" Multidisciplinary Breast Cancer Research Group Meeting, Huntsman Cancer Institute, Salt Lake City, Utah, 22 March 2007.

Charles Torre gave a seminar titled "Classical and Quantum Features of the Gowdy Model" at Pennsylvania State University, Institute for Gravitational Physics and Geometry, 30 March 2007.

Robert W. Schunk, **Ludger Scherliess**, **Jan J. Sojka**, **Donald C. Thompson**, and **Lie Zhu** presented a talk titled "Operational Data Assimilation Models for Ionospheric Specifications and Forecasts" at the Space Weather Workshop, Boulder, Colorado, 24-27 April 2007.

Ludger Scherliess presented a talk titled "Study of the Large November 2003 Storm Using the GAIM Model" at the Coordinated Data Analysis Workshop, Melbourne, Florida, 6 March 2007.

Faculty Publications

undergraduate*; graduate**

Biology

Mekki F. Bensaci** and **Jon Y. Takemoto**. 2007. Syringopeptin SP25A-mediated Killing of Gram-positive Bacteria and Role of Teichoic Acid D-alanylation. *FEMS Microbiology Letters* 268:106-111.

Jianjun Zhang*, **Hsiao-Nung Chen***, Fang- I. Chiang, **Jon Y. Takemoto**, **Mekki Bensaci****, and **Cheng Wei Tom Chang**. 2007. Sonication-assisted Library Synthesis of Oxazolidine Carbohydrate Conjugates. *Journal Combinatorial Chemistry*. 9:17-19.

Karen E. Mock, Barbara J. Bentz, **Eric M. O'Neill****, Jer-pin Chong, Jon Orwin, and **Michael E. Pfrender**. 2007. Landscape-scale Genetic Variation in a Forest Outbreak Species, the Mountain Pine Beetle (*Dendroctonus ponderosae*). *Mol Ecol* 16:553-68.

Debra L. Fisk**, **Leigh C. Latta IV****, Roland A. Knapp, and **Michael E. Pfrender**. 2007. Rapid Evolution in Response to Introduced Predators I: Rates and Patterns of Morphological and Life-history Trait Divergence. *BMC Evolutionary Biology* 7:22 (14 Feb 2007).

Leigh C. Latta IV**, Jeremy W. Bakelar, Roland A. Knapp, **Michael E. Pfrender**. 2007. Rapid Evolution in Response to Introduced Predators II: The Contribution of Adaptive Plasticity. *BMC Evolutionary Biology* 7:21 (14 Feb 2007).

Houlahan, Jeff E., David J. Currie, Karl Cottenie, Graeme S. Cummings, **S.K. Morgan Ernest**, C. Scott Findlay, Samuel D. Fuhlendorf, Ursula Gaedke, Pierre Legendre, John J. Magnusson, Brian H. McArdle, Esteban H. Muldavin, David Noble, Roly Russell, Richard D. Stevens, Theodore Willis, Ian P. Woivod, Steve M. Wondzell. 2007. Compensatory Dynamics are Rare in Natural Ecological Communities. *Proceedings of the National Academy of Sciences, USA* 104:3273-3277.

C. Toro-Castillo, **Ashish Thapliyal**, H. Gonzalez-Ochoa, **Brett A. Adams**, and U. Meza. 2007. Muscarinic Modulation of CaV2.3 (R-type) Calcium Channels is Antagonized by RGS3 and RGS3T. *American Journal of Physiology (Cell Physiology)* 292:C573-580.

U. Meza, **Ashish Thapliyal**, Roger A. Bannister, and **Brett A. Adams**. 2007. Neurokinin 1 Receptors Trigger Overlapping Stimulation and Inhibition of CaV2.3 (R-type) Calcium Channels. *Molecular Pharmacology* 71:284-293.

James P. Pitts, **Joseph S. Wilson****, and Frank D. Parker. 2007. The Spider Wasps of Fiji (*Hymenoptera: Pompilidae*). *Occasional Papers of the Bishop Museum* 91:3-15.

Filippo Barni, Andrea Berti, Antonio Pianese, Antonio Boccellino, **Mark P. Miller**, Aldo Caperna, and Giampietro Lago. 2007. Allele Frequencies of 5 Autosomal STR Loci in the Iraq Population with Comparisons to Other Populations from the Middle-Eastern Region. *Forensic Science International* 167: 87-92.

Vincent J. Tepedino, **Diane G. Alston**, Brosi A. Bradley, Trent R. Toler, and **Terry L. Griswold**. 2007. Orchard Pollination in Capitol Reef National Park, Utah, USA. Honey Bees or Native Bees? *Biodiversity and Conservation* DOI 10.1007/s10531-007-9164-8 (12 pp.).

Chemistry & Biochemistry

Russell A. Allred**, **Sara A. Huefner***, **Katarzyna Rudzka****, Atta M. Arif, and **Lisa M. Berreau**. 2007. A Cadmium Hydroxide Complex of a N₃S-donor Ligand Containing Two Hydrogen Bond Donors: Synthesis, Characterization, and CO₂ Reactivity. *Dalton Transactions* 351-357.

A. N. Alexandrova**, **A. I. Boldyrev**, **H.-J. Zhai**, **L. S. Wang**. 2006. All-Boron Aromatic Clusters as Potential New Inorganic Ligands and Building Blocks in Chemistry. *Coordination Chemistry Reviews* 250: 2811-2866.

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Computer Science

Chad D. Mano, Jeff Smith, Bill Bordogna, Andrew Matta, Dan Dugovic, and Aaron Striegel. 2007. CLog: Low Cost Gigabit Full Packet Logging. *Journal of Communication* 1(7):17-23.

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S. Clyde and S. Salkowitz. April 2006. The Unique Records Portfolio, Ed. D. Ross, E. Wild, A. Hinman, and T. Hastings, Public Health Informatics Institute, Decatur, Georgia.

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R. V. Heermance III** and **J.P. Evans**. 2006. Evolution of the Chelungpu Fault, Taiwan: The Mechanics of Frontal Ramps and Fault Imbrication. *Journal of Structural Geology* 28: 929-928.

Anthony R. Lowry. 8 March 2007. California's Cloudbursts Pave the Way for Quakes. *New Scientist magazine* (issue 2594 page 11) at <http://environment.newscientist.com/channel/earth/mg19325944.000-californias-cloudbursts-pave-the-way-for-quakes.html>.

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Mathematics & Statistics

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Physics and The Center for Atmospheric & Space Sciences

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****Geonhwa Jee**, A. G. Burns, W. Wang, S. C. Solomon, **Robert W. Schunk**, **Ludger Scherliess**, **Donald C Thompson**, **Jan J. Sojka**, and **Lie Zhu**. 2007. Duration of an Ionospheric Data Assimilation Initialization of a Coupled Thermosphere-Ionosphere Model. *Space Weather* 5, S01004, doi:10.1029/2006SW000250.

Sarah E. McDonald, Sunanda Basu, Santimay Basu, Keith M. Groves, Cesar E. Valladares, **Ludger Scherliess**, **Donald C. Thompson**, **Robert W. Schunk**, **Jan J. Sojka**, and **Lie Zhu**. 2006. Extreme Longitudinal Variability of Plasma Structuring in the Equatorial Ionosphere on a Magnetically Quiet Equinoctial Day. *Radio Science*, 41, RS6S24, doi:10.1029/2005RS003366.

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