



Science Scene

Research Report

August to September 2006

A Publication of the College of Science, Utah State University

—The Dean's Corner—

As you know, I will be stepping down from the dean's position at the end June 2007. The search committee for Dean of Science has now met a number of times, a position description has been prepared, and the search coordinator, Vice Provost Larry Smith, is already contacting nominees for the position. There are two important items that we should address with respect to this search.

First, consider nominating colleagues or associates whom you feel have the credentials to lead our college. We are seeking a large comprehensive pool of candidates to consider and evaluate, so don't be concerned that there will be too many nominations.

Second, we should anticipate that those interested in this position will make extensive use of the internet to seek out details and information about the University, the College of Science, our departments, and our faculty. We must review all web pages as soon as possible to confirm that the information presented is current and that all links are active. In the Dean's office, we are in the process of revising and updating the college web pages and I urge each of you with a home page to do the same. Our objective should be to make the most positive statement possible about the College of Science as a vibrant active center for teaching and research. Updates and information about the search for Dean of Science may be obtained at: <http://www.usu.edu/provost/employment/>

As I prepared the table on contract and grant activity shown below, I noted that our faculty have already submitted proposals for more than \$12 million in research funding since July 1. This two-month total represents more than 25% of the total dollar value of proposal submissions for all of the previous fiscal year. I realize that some of this activity represents July submission deadlines for many NSF divisions and other funding agencies, but I want to encourage all faculty to sustain this effort throughout the year. We all know that funding only comes if proposals are submitted, and in many cases, revised and resubmitted, so please do not become frustrated or discouraged by the reports of low agency funding rates. Persistence in these efforts will pay off. To assist in your efforts, the Sponsored Programs Office will be offering a number of workshops this academic year on various aspects of grant writing. Some of these workshops will be funding agency-specific, such as NSF or NIH. Look for emails and announcements here in *Science Scene* or on the SPO website.

Please send any comments or suggestions for research-related issues that you would like to see presented in *Science Scene* to me via email at <don.fiesinger@usu.edu>.

— COLLEGE OF SCIENCE CONTRACT & GRANT ACTIVITY —

Amounts (# of proposals)	July 2006	August 2006	Cumulative Totals for FY06-07
Proposals Submitted	\$9,441,145 (22)	\$3,020,701 (12)	\$ 12,461,846 (34)
Awards Received	\$ 622,022 (10)	\$ 985,494 (10)	\$ 1,607,516 (20)



— GRADUATE STUDENT ACTIVITIES —

Student Awards, Recognition & Grants

Biology

The doctoral research of **Kristin Bakkegard** who works in **Butch Brodie's** lab is featured on *Utah State Today* at <http://www.usu.edu/ust/index.cfm?article=9889>.

Student Presentations

Biology

The following presentations were made at *Evolution 2006*, the Joint Annual Meeting of the Society for the Study of Evolution, the Society of Systematic Biologists, and the American Society of Naturalists, Stony Brook, New York, 23-27 June 2006:

Alison Scoville gave a talk titled “Epistasis Constrains the Evolution of Phenotypic Plasticity in a Subdivided Population: Results from a Quantitative Genetic Model.”

Allen Spaulding presented a poster titled “Sexual Selection and Rapid Evolution in Grouse and Wood Warblers.”

— FACULTY ACTIVITIES —

Awards & Recognition

Biology

The research of **Jim Cane** has been featured on ABCNEWS.com. For the complete story, go to <http://abcnews.go.com/Technology/wireStory?id=2311259>.

Effective 1 August 2006, **S. K. Morgan Ernest**, Assistant Professor of Biology, assumed the directorship of the NSF LTREB: Experimental Manipulation and Monitoring of an Arid Ecosystem at Portal, Arizona. Morgan has been actively involved with the research at this LTREB for the past 11 years. This is a significant coup for her and reflects the high regard she enjoys from her colleagues. According to NSF, an LTREB (Long-Term Research in Environmental Biology) allows investigators to ask “[m]any important questions in ecology, behavior, and environmental biology [that] require the acquisition of long time series of data.” Funding of LTREB’s “are designed to provide funding to help maintain an on-going long-term research project.”

Joe Li was recognized and received the 2006 USU/ECEA Friend of Regional Campuses and Distance Education award on 10 August 2006 at the annual USU-Uintah Basin campus conference.

Faculty Grants

Biology

Daryll B. DeWald

University of Utah

1 April 2006 to 31 March 2007—\$22,581

“Phosphoinositide and Inositol Polyphosphate Probes.”

Jay Karren

Utah Department of Agriculture and Food

1 January 2006 to 31 December 2006—\$10,335

“Silver Y Moth and Egyptian Cottonworm Survey.”

Mark P. Miller

Whirling Disease Foundation, Inc.

1 July 2006 to 31 December 2007—\$15,000

“QTL Analyses of Rainbow Trout that are Resistant and Susceptible to Whirling Disease.”

Keith A. Mott

United States Department of Agriculture / Cooperative State

Research Education & Extension Service /

National Research Initiative

15 August 2006 to 14 August 2007—\$9,500

“Conference: The Biology of Transpiration: From Guard Cells to Globe.”

Kristina J. Watson

National Institutes of Health /

National Institute on Deafness & Other Communication Disorders

1 September 2006 to 31 August 2007—\$52,048

“The Role of Aquaporins in Taste.”

Chemistry & Biochemistry

Lisa M. Berreau

Herman Frasch Foundation
1 July 2006 to 30 June 2007—\$40,000
“Investigation of Chemical Pathway of Fungal Resistance in Plants: Manganese-Mediated Oxalate Catabolism.”

Alvan C. Hengge

National Institutes of Health
1 September 2006 to 31 August 2007—\$230,747
“Mechanisms of Acyl, Phosphoryl, and Sulfuryl Transfer.”

Computer Science

Scott R. Cannon

Science Applications International Corporation
3 August 2006 to 31 December 2006—\$25,000
“Responsive Space Bus Demonstration Software.”

Stephen Clyde

National Scenic Byways
1 May 2006 to 30 April 2007—\$216,617
“Information Systems Development and Support for the National Scenic Byways Program.”

Stephen Clyde

National Scenic Byways
1 August 2006 to 31 July 2007—\$15,000
“Adding of the Bureau of Land Management (BLM) National Back Country Byways on the National Scenic Byways Website.”

Vladimir Kulyukin

AT Sciences, LLC
15 June 2006 to 14 June 2007—\$6,605
“A Three-Sensor Walker for Alzheimer’s Elderly Patients.”

Geology

Carol M. Dehler

United States Geological Survey
1 July 2006 to 30 June 2007—\$8,500
“Jesse Ewing Canyon Formation, Uinta Mountain Group, Utah and Colorado.”

Thomas E. Lachmar

United States Department of Agriculture Forest Service
5 June 2006 to 15 May 2007—\$50,925
“Marx Creek Ground Water Spawning Channel near Hyder, Alaska.”

Joel L. Pederson

National Science Foundation
1 August 2004 to 31 July 2007—\$48,811
“Geomorphic and Geochronologic Study in and near the Grand Canyon.”

Mathematics & Statistics

James S. Cangelosi

Utah State Office of Education
31 May 2004 to 31 August 2007—\$162,042
“Technology-Enhanced Learning Communities.”

James A. Powell

United States Department of Agriculture / Forest Service / Rocky Mountain Research Station
18 July 2006 to 30 October 2006—\$11,200
“MATLAB Implementation of an Improved Southern Pine Beetle Phenology Model and Hypotheses of Spot Initiation and Success.”

Physics and The Center for Atmospheric & Space Sciences

Bela G. Fejer

National Aeronautics & Space Administration
28 June 2006 to 27 July 2009—\$108,000
“Storm-Time Ionospheric Electric Fields.”

Eric D. Held

Department of Energy
15 September 2006 to 14 September 2007—\$60,000
“Center for Extended Magnetohydrodynamic Modeling.”

Robert W. Schunk

National Science Foundation
1 September 2006 to 31 August 2009—\$499,999
“Continuing Theoretical Studies of Dynamical Processes in the Ionosphere.”

Faculty Presentations & Related Professional Activities

Biology

Timothy A. Gilbertson presented a seminar titled “Is There Hope in the Fight Against Obesity?” at the Regional Supervisors’ Meeting, Regence Blue Cross/Blue Shield of Utah, Salt Lake City, Utah, 3 August 2006.

Timothy A. Gilbertson presented a seminar titled “Sensory Properties of Lipids: Chemosensory Cues for Dietary Fat and the Modulation by Diet” to the Department of Nutrition and Food Sciences, Utah State University, Logan, Utah, 6 September 2006, and to the Division of Endocrinology, Metabolism and Diabetes in the Department of Internal Medicine, University of Utah School of Medicine, Salt Lake City, Utah, 7 September 2006.

Lianna Hatfield-Etchberger presented a poster titled “Small Mammal Host and Flea Distributions in a White-tailed Prairie Dog Ecosystem” at the International and Southwest Conferences on Diseases in Nature Communicable to Man, San Antonio, Texas, 3 August 2006.

Mark P. Miller gave a keynote lecture titled “Spatial Analyses of Genetic Structure in Landscape-scale Investigations” at the course titled “Conservation Genetics Data Analysis: Recent Approaches for Estimation of Population Size, Structure, Gene Flow, Percentage, and Selection Detection,” Porto, Portugal, 30 August – 2 September 2006.

Theresa L. Pitts-Singer, Christelle Guedot, and Cory Vorel presented a poster titled “Relating Behavioral Attributes of Aggregating, Solitary Bees to those of Social Bees” at the XI Congress of the International Union for the Study of Social Insects, Washington, DC, 30 July – 4 August 2006.

Tian Yu, Bhavik Shah, and Timothy A. Gilbertson presented a seminar titled “The Obesity Epidemic: Are our Taste Buds to Blame?” to the Foundation Trustees of Utah State University, Logan, Utah, 15 September 2006. This seminar was part of the Old Main Weekend.

The following presentations were given at Botany 2006, Chico, California, 28 July – 2 August 2006:

Joshua P. Der, John A. Thomson, and Paul G. Wolf. “A Global Phylogeographic Study of the Chloroplast Genome in Bracken (*Pteridium: Dennstaedtiaceae*).”
In recognition of his talk, Josh Der received a student travel award from the Pteridological Section of the Botanical Society of America.

Mark W. Ellis, Rochelle E. Gainer, and Paul G. Wolf. Poster. “Genetic Analyses Support Taxonomic Recognition of *Eriogonum corymbosum* var. *nilesii*.”

Kenneth G. Karol, Jo Ann Banks, Jessie M. Roper, S. Kellon Hansen, Paul G. Wolf, Jennifer V. Kuehl, Jeffrey Boore, Karin Everett, Dina F. Mandoli, and Richard G. Olmstead. “Plastid Genome Evolution in Lycophytes.”

Jessie M. Roper, S. Kellon Hansen, and Paul G. Wolf. “Structural Evolution of Fern Chloroplast Genomes.”

Norman J. Wickett, Yan Zhang, S. Kellon Hansen, Jessie M. Roper, Jennifer V. Kuehl, Sheila A. Plock, Bernard Goffinet, Claude W. dePamphilis, Paul G. Wolf, and Jeffrey Boore. “Towards a Complete Chloroplast Genome Sequence of the Non-photosynthetic Liverwort *Cryptothallus mirabilis* (Metzgeriales, Marchantiophyta).”

The following presentations were given at the 91st Annual Meeting of the Ecological Society of America, Memphis, Tennessee, 6 – 11 August 2006:

S. K. Morgan Ernest, James H. Brown, Jacob R. Goheen, Katherine M. Thibault, and Ethan P. White. “A Temporal Perspective on the Role of Deterministic Assembly, Metacommunities, and Zero-Sum Dynamics.”

Ethan P. White, Brian J. Enquist, S.K. Morgan Ernest, and Jessica L. Green. Poster. “Impacts of Methodology on Understanding the Form of the Individual Size-Distribution.”

The following presentations were made at the 43rd Annual Meeting of the Animal Behavior Society, Snowbird, Utah, 12-16 August 2006:

Amanda V. Bakian, Kimberly A. Sullivan, and Eben Paxton. “Gender Impacts Core Area Habitat Use and Selection Behavior: A Study using Willow Flycatchers.”

Theresa L. Pitts-Singer. “Attraction of Solitary Bees (Family Megachilidae) to Dufour’s Glands: 2006 Preliminary Results.”

Kimberly A. Sullivan, Amanda V. Bakian, Sephonnie Ellis, and Brittany Webb. “Leaving the Flock: The Effects of Gender on Society Participation.”

Cory Vorel, Theresa L. Pitts-Singer, and N. Frank. “The Proboscis Extension Reflex in Hymenoptera of Different Social Levels.”

Chemistry & Biochemistry

The following posters were given at the 232nd American Chemical Society National Meeting & Exposition, San Francisco, California, 10-14 September 2006. (* denotes undergraduate)

Katazyna Rudzka, Atta M. Arif, and Lisa M. Berreau. “Glyoxalase I-type Hemithioacetal Isomerization Reactivity of a Mononuclear Ni(II) Deprotonated Amide Complex.”

Gajendrasingh Ingle, Magdalena M. Mokowska-Grzyska, Ewa Szajna-Fuller, Sara Huefner,* John C. Price,* Atta M. Arif, and Lisa M. Berreau. “Influence of a Chelate Ligand Structure on Amide Methanolysis Reactivity of Mononuclear Zinc Complexes.”

Ewa Szajna-Fuller, Bonnie M. Chambers,* Atta M. Arif, and Lisa M. Berreau. “Carboxylate Chemistry of a Mononuclear Ni(II) Center in a Hydrophobic Microenvironment: Relevance to Acireductone Dioxigenases.”

Computer Science

Chad D. Mano and David Cieslak gave a presentation titled “Passive Wireless Host Detection Using Local RTT Timing Characteristics on an Enterprise Network” at the Workshop on Enterprise Network Security, Baltimore, Maryland, 28 August 2006.

Mathematics & Statistics

Richard D. Cutler gave a presentation titled “Predicting Invasive Plant Species in National Parks, A Proof of Concept Using *Verbascum Thapsus* in Lava Beds National Monument,” Flagstaff, Arizona, September 2006.

Mark E. Fels gave a presentation titled “Exterior Differential Systems with Symmetry I and II,” and “Differential Geometry with Maple” at the Geometry and Symmetry of Differential Equations Workshop, Hotel Isola, Santa Marinella, Italy, 4 July 2006 and 11 July 2006.

Mark E. Fels gave a presentation titled “Exterior Differential Systems with Symmetry” at the Symmetries and Over Determined Systems of Partial Differential Equations Institute for Mathematics and its Applications, Minneapolis, Minnesota, 17 July 2006 - 4 August 2006.

Mark E. Fels gave the following presentations in Madrid, Spain:

“Darboux Integrability” at the Advances in PDE Geometry (ICM Satellite conference), 31 August 2006.

“Differential Geometry with Maple” at the 21st International Workshop on Differential Geometric Methods in Theoretical Mechanics (ICM Satellite conference), 31 August 2006 - 7 September 2006.

(Colloquium) “Differential Geometry and Lie Theory with Maple” at the Department of Theoretical Physics, Universidad Complutense De Madrid, 5 September 2006.

(Plenary Lecture) “Symmetry Reduction of Exterior Differential Systems,” at the 21st International Workshop on Differential Geometric Methods in Theoretical Mechanics (ICM Satellite conference), 31 August 2006 - 7 September 2006.

The following presentations were given at the Joint Statistical Meetings of the American Statistical Association, Seattle, Washington, 6-10 August 2006:

Mevin B. Hooten. “Characterizing Invasions with Hierarchical Rule-Based Systems.”

Michael C. Minnotte. “Variable Bandwidth Mode Testing.”

Xiaofeng Ren gave a presentation titled “Nucleation in the FitzHugh-Nagumo System: the Interface-Spike Solutions” at Academia Sinica, Taipei, China, 8 August 2006.

Xiaofeng Ren gave a presentation titled “An Introduction to the Density Functional Theory of Block Copolymers” at the National Taiwan Normal University, Taipei, China, 14 August 2006.

Xiaofeng Ren gave a presentation titled “The Critical Mass Constraint in the Cahn-Hilliard Problem” at the Department of Mathematics, Chinese University of Hong Kong, Hong Kong, China, 11 May 2006; at the Sixth East Asia PDE Conference, Wuhan University, Wuhan, China, 15 May 2006; at the International Conference on Partial Differential Equations and Numerical Analysis, Changuha, Taiwan, 25 June 2006; and at the Academia Sinica, Taipei, China, 8 August 2006.

Xiaofeng Ren gave a presentation titled “An Allen-Cahn Type Problem with Curvature Modification” at the Workshop on Singularities in PDE and the Calculus of Variations, Centre de Mathematiques, University De Montreal, Canada, 19 July 2006; at the National Changhua University of Education, Changhua, China, 4 August 2006; and at the Academia Sinica, Taipei, China, 15 August 2006.

Xiaofeng Ren gave a presentation titled “The Ohta-Kawasaki Theory of Diblock Copolymers: A Mathematical Study” at the Academia Sinica, Taipei, China, 1 August 2006; at the National Chiao Tung University, Hsinchu, Taiwan, 16 August 2006; and at the National Taiwan University, Taipei, China, 24 August 2006.

John R. Stevens and **David I. Schlipalius** gave a presentation titled “Dose-Response Modeling with Marginal Information on a Missing Categorical Covariate” at the 18th Conference on Applied Statistics in Agriculture, Manhattan, Kansas, 1 May 2006.

Faculty Publications

Biology

Jake R. Goheen, Ethan P. White, S. K. Morgan Ernest, and James H. Brown. 2006. “Intra-Guild Compensation Regulates Species Richness in Desert Rodents: Reply.” *Ecology* 87:2121-2125.

Erik M. Pilgrim and **James P. Pitts.** 2006. “A Molecular Method for Associating the Dimorphic Sexes of Velvet Ants (Hymenoptera: Mutillidae).” *Journal of the Kansas Entomological Society* 79:222-231.

Carmen Toro-Castillo, Ashish Thapliyal, Hector Gonzalez-Ochoa, Brett A. Adams, and Ulises Meza. 2006. “Muscarinic Modulation of CaV2.3 (R-type) Calcium Channels is Antagonized by RGS3 and RGS3T.” *American Journal of Physiology and Cell Physiology* doi:10.1152/ajpcell.00219.2006.

Chemistry & Biochemistry

Erin A. Clark, Bradley S. Davidson, Paul A. Wender, and Susan L. Mooberry. 2006. Lulimalide and Synthetic Lulimalide Analogs are Synergistic With Paclitaxel and 2-Methoxyestradiol. *Molecular Pharmacology* 3:457-467.

W. Wallace Cleland and **Alvan C. Hengge.** 2006. Enzymatic Mechanisms of Phosphate and Sulfate Transfer. *Chemical Reviews* 106(8): 3252-3278.

Kerensa Sorensen-Stowell and Alvan C. Hengge. 2006. Thermodynamic Origin of the Increased Rate of Hydrolysis of Phosphate and Phosphorothioate Esters in DMSO/Water Mixtures. *Journal of Organic Chemistry* 71(19): 7180-7179.

Geology

Anthony R. Lowry. 2006. Resonant Slow Fault Slip in Subduction Zones Forced by Climatic Load Stress. *Nature* 442:802-805.

John W. Shervais. 2006. Significance of Subduction-related Accretionary Complexes in Early Earth Processes. *Early Earth Processes*, Geological Society of America, Special Paper 405:173-192.

John W. Shervais, David L. Kimbrough, Paul Renne, Benita Murchey, and Barry B. Hanan. 2006. Multi-stage Origin of the Coast Range Ophiolite, California and Oregon: Implications for the Life Cycle of Supra-subduction Zone Ophiolites. *Phase Relations, High Pressure Terranes, P-T-ometry, and Plate Pushing: A Tribute to W.G. Ernst* 9:570- 596.

John W. Shervais, Scott K. Vetter, and Barry B. Hanan. 2006. A Layered Mafic Sill Complex Beneath the Eastern Snake River Plain: Evidence From Cyclic Geochemical Variations in Basalt. *Geology* 34:365-368.

Geologic Maps (technical reports)

Matthew F. Cooke, John W. Shervais, John D. Kauffman, and Kurt L. Othberg. 2006. Geologic Map of the Dietrich Butte Quadrangle, Lincoln County, Idaho: Idaho Geological Survey, Moscow Idaho, DWM-63, scale 1:24,000.

Matthew F. Cooke, John W. Shervais, John D. Kauffman, and Kurt L. Othberg, 2006, Geologic Map of the Dietrich Quadrangle, Lincoln County, Idaho: Idaho Geological Survey, Moscow Idaho, DWM-66, scale 1:24,000.

Scott H. Matthews, John W. Shervais, John D. Kauffman, and Kurt L. Othberg. 2006. Geologic Map of the Shoshone SE Quadrangle, Jerome and Lincoln Counties, Idaho: Idaho Geological Survey, Moscow Idaho, DWM-62, scale 1:24,000.

Scott H. Matthews, John W. Shervais, John D. Kauffman, and Kurt L. Othberg, 2006, Geologic Map of the Star Lake Quadrangle, Jerome and Lincoln Counties, Idaho: Idaho Geological Survey, Moscow Idaho, DWM-67, scale 1:24,000.

John W. Shervais, Matthew F. Cooke, John D. Kauffman, and Kurt L. Othberg. 2006. Geologic Map of the Owinza Quadrangle, Lincoln County, Idaho, Idaho Geological Survey, Moscow Idaho: Idaho Geological Survey, Moscow Idaho, DWM-64, scale 1:24,000.

John W. Shervais, Scott H. Matthews, John D. Kauffman, and Kurt L. Othberg. 2006. Geologic Map of the Owinza Butte Quadrangle, Jerome and Lincoln Counties, Idaho: Idaho Geological Survey, Moscow Idaho, DWM-65, scale 1:24,000.

Mathematics & Statistics

Adele Cutler and John R. Stevens. Random Forests for Microarrays. *Methods in Enzymology* 411:422-43.

Richard D. Cutler 2006. Vitamin D Receptor Genotype and Risk of Osteoporotic Hip Fracture in Elderly Women of Utah: an Effect Modified by Parity. *Osteoporosis International* 17:1146-1153.

Alan Taylor, John R. Stevens, and J. William Asher. The Effects of Explicit Reading Strategy Training on L2 Reading Comprehension: A Meta-Analysis. *Synthesizing Research on Language Learning and Teaching* p. 213-244.

Science Scene is an internal newsletter sent to the Utah State Board of Trustees, Utah State Administration, and the College of Science faculty and staff. It is published regularly throughout the school year. Its purpose is to inform the Board of Trustees and the College of the research activities of our faculty and students, also providing a forum for peers to follow one another's careers and professional development.



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