



Science Scene

Research Report

June 2009 to September 2009

A Publication of the College of Science, Utah State University

—The Dean's Corner—

As another academic year gets underway, it is clear to me that college faculty have been busy based on the number of proposal submissions and award announcements that have crossed my desk in the past couple months. With additional stimulus funding for research and our new status as an NSF EPSCoR state, this is an exciting time for research in the College of Science. College faculty members are now also working on six of the eight USU USTAR projects. EPSCoR status means that NSF proposals can now be considered for co-funding which provides additional funds to program directors to fund strong but not necessarily the top tier proposals from PIs in EPSCoR states. Utah will also submit a Research Infrastructure Improvement grant to NSF with a theme centered on water, energy, and the atmosphere that includes a STEM education component. If funded, this grant will provide support to scientists at the U of U, USU, and BYU.

I would like to take this opportunity to thank science faculty who have participated in the Science Unwrapped lecture series. We have had faculty present in the series and faculty have been serving on the committee that has organized the lectures and the after-events. Thank you also to those of you who have attended these presentations. Lectures have drawn an enthusiastic group of 250-500 people each month and the audience has included an age spectrum ranging from kindergarteners to summer citizens. These talks provide an excellent venue through which to inspire the next generation of scientists and to enhance science literacy of the community. The college was involved in a number of other outreach activities this summer with high school students on campus and K-12 teachers too. Roughly \$15,000,000 worth of STEM education proposals have been submitted by CoS faculty in the past two months with another \$2,000,000 in preparation for submission in the next month. I look forward to seeing the fruits from these efforts. Best of luck with research endeavors for the 2009-2010 academic year.

— College of Science Contract & Grant Activity —

Amounts (# of proposals)	April 2009	May 2009	June 2009	Cumulative Totals for FY08-09
Proposals Submitted	\$4,492,375 (13)	\$5,492,595 (15)	\$6,802,858 (18)	\$68,433,646 (174)
Awards Received	\$426,196 (4)	\$609,246 (11)	\$732,869 (11)	\$7,337,622 (96)



— Undergraduate Presents at National Posters on the Hill in Washington, DC —

Sixty research students from across the country traveled to Washington D.C. on May 5, 2009 to participate in the Conference on Undergraduate Research's Posters on the Hill event. USU's Bradley Hintze was among those in attendance this year and was the only student researcher representing the state of Utah.

Posters on the Hill is an annual conference that highlights some of the best undergraduate researchers and their faculty advisors. The researchers meet with their elected representatives to discuss their specific projects and the contribution of undergraduate research to university education.

"I enjoyed the fact that we were able to meet with Senators Bennett and Hatch and Representative Matheson to discuss the importance of research in an undergraduate's academic career," said Hintze. "I hope that when a bill comes before the legislature about research funding, they will remember what we discussed."



Senator Bennett, Bradley Hintze, and Sean Johnson

After meeting with Utah's representatives, Hintze presented his research on structural biology at a poster session. Structural biology deals with deciphering the structure of proteins at atomic resolution. His focus was the creation of a suite of computer programs that assist in determining the structure of low-resolution proteins.

"We're getting information that's never been known," said Hintze. "That fascinates me."

"As a new administration and congress talk more than ever about the importance of research and its ability to drive innovation and economy, this event and these visits are timely and crucial to the mission of CUR: to support and promote high-quality undergraduate student-faculty collaborative research and scholarship," said Robin Potochnik, senior director of communications at CUR.

Hintze was accompanied to the conference by his faculty mentor, Sean Johnson, assistant professor of chemistry and biochemistry.

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

Overall, Hintze was glad for the experiences he had at Posters on the Hill.

"I learned the importance of contacting your legislators about issues you care about," said Hintze. "Most basic research funding comes from federal agencies whose budgets are determined by congress. To undergraduates, I would implore you to pursue undergraduate research or internships. These opportunities provide learning experiences that cannot be duplicated in the classroom or even teaching labs. Be excited about research!"

Written by: Anna McEntire

— Undergraduate CIB Research Grants 2009-2010 —

As part of Utah State University's ongoing effort to encourage research pursuits at all levels of study, the Center for Integrated BioSystems awarded Undergraduate CIB Research Grants for 2009-2010 to the following College of Science students:

Biology

Sherry Baker with Daryll DeWald
Spencer Hyde with Timothy Gilbertson

Justin La with Daryll DeWald
Cody Tramp with Dennis Welker

Chemistry & Biochemistry

Megi Rexhepaj with Sean Johnson

— Office of Proposal Development —

The Office of Proposal Development (OPD) was created in 2008 under the Vice President for Research to assist USU researchers in developing stronger and more competitive proposals for submission to sponsors. The OPD is dedicated to expanding externally funded research at USU through the management of the proposal development process on strategically important submissions, training researchers on proposal development (such as via the annual Proposal Writing Institute), fostering interdisciplinary collaborations, and providing services to researchers that advance their skills and success in obtaining funding. College of Science participants in the 2009 Proposal Writing Institute were John Stevens (Mathematics & Statistics), Sean Johnson (Chemistry & Biochemistry), and Shane Larson (Physics).

The OPD is comprised of a network of proposal development specialists located in the units (colleges/departments/major research centers) across campus. The goal of the OPD network specialist is to relieve researchers of the logistics of proposal development to allow them more time to focus on their specialty. To date, OPD network staff members have assisted researchers in the development of over 20 proposals worth potentially \$40 million, with another dozen proposals currently in the development process.

For questions regarding the OPD and the services offered, please contact Jeri Hansen, Manager of Proposal Development, at 7-3437 or jerilyn.hansen@usu.edu.

— EPSCoR Approval —

The Utah EPSCoR Committee has been notified by the National Science Foundation that the state EPSCoR Planning Grant has been approved. This means that researchers at USU (and other institutions for higher education in the state) are now officially eligible for EPSCoR co-funding of their NSF proposals. Consideration for NSF co-funding of proposals from USU PIs is automatic; it is embedded in the NSF review process and does not require any special action by researchers. Please see www.nsf.gov/od/oia/programs/epscor/about.jsp for additional information related to NSF EPSCoR and the co-funding process.

— Upcoming Undergraduate Research Deadlines/Events —

October 15, 2009: Round I of URCO applications due at noon; may be submitted to Old Main 159 or sent electronically to Dr. Joyce Kinkead: Joyce.Kinkead@usu.edu; <http://research.usu.edu/undergrad/htm/funding-opportunities/urco/>

Research on Capitol Hill (Jan. 28, 2010; abstract deadline Nov. 1, 2009); <http://research.usu.edu/undergrad/htm/sharing-your-research/research-on-capitol-hill/>

Utah Conference on Undergraduate Research (Feb. 26, 2010; abstract deadline Nov. 1, 2009); <http://www.ucur.org/>

CUR Posters on the Hill (April 2010; abstract deadline Nov. 10, 2009); <http://www.cur.org/postersession.html>

National Conference on Undergraduate Research (April 15-17, 2010 at University of Montana; abstract deadline Dec. 1, 2009); <http://www.umt.edu/ncur2010/>; Contact Joyce Kinkead (Joyce.Kinkead@usu.edu) for more information

— STUDENT ACTIVITIES —

Student Awards, Recognition & Grants

undergraduate*; graduate**

Chemistry & Biochemistry

Bradley Hintze* and **Yalemi Morales*** received National Science Foundation Predoctoral Fellow Honorable Mention recognition.

Ryan Jackson** received the Graduate Student Senate Travel Award for \$300 to present his poster at the American Crystallographic Association annual meeting in Toronto, Canada, 25-30 July 2009.

Student Presentations

Chemistry & Biochemistry

Alina Sergeeva** presented a poster titled “Ab Initio, Photoelectron Spectroscopy, and Mass-Spectroscopic Probing of Negative Electron Binding Energy, Electronic Structure and Stability of Isolated and Solvated Multiply-charged Anions” at the celebration of 40 Years of Ion Chemistry, Boulder, Colorado, June 2009.

Bradley Hintze* presented poster titled “A New Tool to Assist Low-Resolution Structure Determination” at the Council for Undergraduate Research 2009 Posters on the Hill meeting in Washington, D.C. 5 May 2009.

Ryan Jackson** presented a poster titled “Crystal Structure of the RNA Helicase, Mtr4” at the American Crystallographic Association annual meeting in Toronto, Canada, 25-30 July 2009.

Computer Science

Jared Robertson (MS student) presented a paper, co-authored by **Daniel Bryce**, titled “Reachability Heuristics for Incomplete Domains” at the Workshop on Heuristics for Domain Independent Planning at the 19th International Conference on Automated Planning and Scheduling, Thessaloniki, Greece, 20 Aug 2009.

Physics

Sydney Chamberlin* presented a paper titled “Symbolic Computation for Gravitational Physics II” at the 25th Pacific Coast Gravity Meeting, University of Oregon, Eugene, OR, March 2009.

The Center for Atmospheric & Space Sciences

Durga N. Kafle** and **Vincent B. Wickwar** presented a poster titled “Mesospheric Atmospheric Gravity Wave Properties Derived From Rayleigh-Scatter Lidar Observations Above Logan, Utah” at the 2009 Joint Assembly held in Toronto, Ontario, Canada, 24-27 May 2009.

The following posters were presented at the CEDAR Meeting held in Santa Fe, New Mexico, 28 June-2 July 2009.

Amal Chandran, D. W. Rusch, A. W. Merkel, S.E. Palo, G. E. Thomas, E. J. Jensen, and **Michael J. Taylor**. “Gravity Wave Effects on Polar Mesospheric Clouds: A Comparison of Numerical Simulations.”

Narayan Chapagain** and **Michael J. Taylor**. “Ionospheric OI 630 nm Airglow Depletion Zonal Velocities Over Ascension Island.”

Durga N. Kafle** and **Vincent B. Wickwar**. “Mesospheric Atmospheric Gravity Waves Observed by Rayleigh-Scatter Lidar.”

Michael E. Olson*, **Bela G. Fejer**, J. L. Chau, C. Stolle, Larisa P. Goncharenko. “Equatorial Zonal Electric Fields During the 2003 Sudden Stratospheric Warming Event.”

Lance W. Peterson*, **Michael J. Taylor**, **Matt A. Bailey**, J. Hayes, **Pierre-Dominique Pautet**, and S. A. Cummer. “Comparison of Sprite-Halo Characteristics Imaged Over the USA and South America.”

Jonathan Rich Pugmire*, **Michael J. Taylor**, Kim Nielsen, A. Wall, J. Thompson, and **Pierre-Dominique Pautet**. “Intra-Annual Comparison of Mesospheric Gravity Waves Over Halley and Rothera Stations Antarctica.”

Don D. Rice**, **Jan J. Sojka**, and **Donald C. Thompson**. “An Expert System for Ionogram Reduction (ESIR).”

Camille Briana Smith*, **Michael J. Taylor**, **Pierre-Dominique Pautet**, A. Fragoso, and H. Takahashi. “Mesospheric Gravity Waves Over Equatorial Brazil.”

Deepak B. Simkhada** and **Michael J. Taylor**. “Ripple Climatology Observed in the Mesopause Region Over Maui, Hawaii.”

Jonathan V. Thompson*, Vince Eccles, **Jan J. Sojka**, Hien Vo, and Sixto Gonzalez. “Tool for the Assessment of Ionospheric Models.”

Jaimy Tomlinson*, **Jodie Tvednes***, **Michael J. Taylor**, Matt Deland, and Mark Zalcik. “Correlation of Mesospheric Polar Cloud Observational Data for the Northern Hemisphere in 2007.”

Student Publications

The Center for Atmospheric & Space Sciences

Narayan Chapagain**, **Bela G. Fejer**, and J. L. Chau. 2009. Climatology of Post Sunset Equatorial Spread F Over Jicamarca. *Journal of Geophysical Research* 114, A07307, doi:10.1029/2008JA013911.

— FACULTY ACTIVITIES —

Awards & Recognition

Biology

Congratulations to **Marion Murray**, IPM Project Leader, recipient of the New Specialist Award 2009 from the USU Extension Specialists Association.

Erin Hodgson, Ryan Davis, Erin Frank, Marion Murray, and Diane Alston received the Western Extension Directors Award of Excellence Honorable Mention for “Utah Pests: Pest Diagnostics and Management Resources for Utah” on 22 July 2009.

Chemistry & Biochemistry

The Department of Chemistry & Biochemistry hosted their third annual Summer Internship in Chemistry & Biochemistry, 13-16 July 2009. Fifteen high school juniors and senior participated in the internship, including students from as far away as Indiana and Texas. The internship is designed to introduce teens to undergraduate study and research opportunities at USU. Faculty who hosted participants in their research lab were: **Lisa M. Berreau, Alex Boldyrev, Tom Chang, Alvan Hengge, Joanie Hevel, Sean Johnson, and Lance Seefeldt**. Student mentors were **Brooks Marshall*** (Berreau lab), **Boris Averkiev**** and **Alina Sergeeva**** (Boldyrev lab), **Marina Fosso**** and **Tony Litke*** (Chang lab), **Vyacheslav Kuznetsov**** and **Rochelle Kellet*** (Hengge lab), **Brenda Suh Lailam**** and **Russ Butler*** (Hevel lab), **Chris Bitner*** (Johnson lab), and **Brad Wahlen**** and **Robert Willis**** (Seefeldt lab).

Computer Science

Daniel Bryce received the 2009 Best Dissertation Award at the 19th International Conference on Automated Planning and Scheduling, Thessaloniki, Greece, 22 August 2009.

Faculty Grants

Biology

Paul Wolf and Jacob Davidson*

US Forest Service

2009—\$14,000

“Breeding System of Maguire Primrose”

Diane G. Alston, Marion S. Murray, Ruby Ward

USDA CREES Extension Integrated Pest Management

1 July 2009 – 30 June 2010—\$93,967

“Utah Extension Integrated Pest Management Program”

Timothy Gilbertson and David York

DHHS/NIH/NIDDKD

1 September 2009 - 31 August 2011—\$347,510

“Mechanisms of Peripheral Fat Detection”

Michelle Baker

National Science Foundation

15 August 2009 - 31 July 2013—\$152,647

“Collaborative Research: Using Empirical and Modeling Approaches to Quantify the Importance on Nutrient Spiraling in Rivers”

Daryll DeWald

USDA/ARS

10 August 2009 - 14 August 2010—\$47,571

“Sustaining Wild Bee Populations for Pollination Services”

Daryll DeWald

Frontier Scientific/Echelon Biosciences

29 July 2009 - 26 July 2010—\$30,000

“BIR:IP3R Antagonists”

Michael Pfrender and Edmond Brodie

National Science Foundation

1 August 2009 - 31 July 2012—\$366,500

“Collaborative Research: Molecular-genetic Basis of Parallel Adaption Driven by Coevolutionary Interactions”

Diane Alston

State of Utah, Dept of Ag., Plant Industry

1 July 2009 - 30 June 2010—\$50,000

“Utah Plant Pest Diagnostic Laboratory”

Donald Roberts

USDA

1 January 2009 - 31 December 2009—\$80,180

“Analyzing USA Soil Samples for Pathogens of Insects (Especially Mormon Crickets and Grasshoppers)”

Anne Anderson

USDA/ ARS/ PWA

1 May 2009 - 20 April 2010—\$5,006

“Genomic Analysis of Pseudomonas Chlorpaphis”

Daryll DeWald

Harvey Mudd College

1 May 2009 - 31 December 2009—\$30,457

“RUI: Collaborative Research: SAC9, A novel, Plant-Specific Phosphoinositide Essential for Membrane/Cytoskeleton Dynamics in Arabidopsis”

Diane Alston and Ryan Davis

State of Utah, Dept of Ag & Food

1 March 2009 - 1 November 2009—\$8,000

“CAPS: Emerald Ash Borer (EAB) Agrilus Planipennis (Fairmaire)”

Paul Wolf

USDA/AFS

27 May 2009 - 30 September 2014—\$14,000

“Challenge Cost-Share Agreement: Primula Maguirei Pollinators Study”

James Pitts

State of Utah, Dept of Ag & Food
 1 January 2009 - 31 December 2009—\$12,450
 “CAPS: Imported Fire Ant Survey”

Edward Evans

State of Utah, Dept of Ag & Food
 1 January 2009 - 31 December 2009—\$20,000
 “CAPS: Cereal Leaf Beetle Biological Control”

Kim Sullivan

National Park Service
 20 May 2009 - 30 May 2012—\$45,000
 “Home Range & Resource Use of Clark’s Nutcrackers”

Diane Alston

State of Utah, Dept of Ag, Plant Industry
 1 January 2009 - 31 December 2009—\$49,152
 “Utah Plant Pest Survey and Detection CORE Project”

James Pitts

USDA/ARS/CMAVE
 17 April 2009 - 16 April 2010—\$5,000
 “Taxonomic ID of Fire Ants”

Chemistry & Biochemistry**Vernon Parker**

National Science Foundation
 15 August 2009 - 31 July 2012—\$665,779
 “International Collaborative Research in Chemistry. Is the Single Transitions State Model Appropriate for the Fundamental Reactions of Organic Chemistry?”

This grant allows for the continued development of the USU Department of Chemistry and Biochemistry – Nankai Department of Chemistry collaborative graduate program. Nankai University is located in Tianjin, China.

Robert Brown and Phil Silva

National Science Foundation
 1 August 2009 - 31 July 2011—\$194,482
 “ARRA: Collaborative Research: Reactions and Fate of Amines in the Atmosphere Emitted from Animal Feeding Operations”

Joan Hevel

National Science Foundation
 1 July 2009 - 30 June 2012—\$575,200
 “ARRA: Protein Arginine Methylation by PRMT1”

Computer Science**Renee Bryce**

Computing Research Association CREU program
 15 August 2009 - 31 August 2009—\$23,600
 “An Empirical Study of Bugs in Undergraduate Programming Assignments”

Xiaojun Qi and Vicki Allan

NSF
 15 May 2009 - 30 April 2012—\$305,801
 “REU Site: Research on Computer Vision and Multi-Agent Systems”

Curtis Dyreson

USDOJ/NPS
 15 June 2009 - 15 June 2010—\$24,785
 “CPCEUS: Grand Canyon Research Database”

Geology**John Shervais**

International Continental Drilling Program
 25 August 2009 - 23 November 2009—\$20,000
 “HOTSPOT: The Snake River Scientific Drilling Project”

Joel Pederson

USDOJ/USGS
 1 August 2009 - 31 July 2010—\$13,645
 “Surficial Geologic Mapping in the Oneida Narrows Regions, Southeast Idaho; Addressing the Co-Evolution of the Bear River and Lake Bonneville”

Tammy Rittenour

USGS EDMAP Program
 15 June 2009 - 14 June 2010—\$13,799
 “Suficial Mapping of the Upper Esclante River Alluvail Corridor, Southern Utah”

Tammy Rittenour

USU GEM
 1 July 2009 - 30 June 2010—\$4804
 “Reconstructing Drought and Fire Activity on the High Plains of Southern Utah”

Mathematics and Statistics**James Powell**

The University of Montana
 1 September 2009 - 31 August 2012—\$113,141
 “ARRA: Phenological Coupling and Decoupling in a Mutualism: Temperature Effects on a Bark Beetle Host and Two Fungal Symbionts”

James Powell

US Forest Service, Rocky Mountain Research Station
 28 July 2009 - 30 May 2011—\$30,000
 “Landscape-Scale Enhanced Mountain Pine Beetle & Climate Change Threat Assessment”

Ian Anderson

Waterloo Maple, Inc.
 1 October 2008 - 20 September 2013—\$10,000
 “Differential Geometry Software”

Physics

Haeyeon Yang

National Science Foundation

15 July 2009 - 30 June 2011—\$200,000

“Ordered Array of Uniformly Sized Quantum Dots for High Efficiency Solar Cells”

Shane Larsen

USU Research Catalyst

1 July 2009 - 30 June 2010—\$19,986

“Probing Gravity in Gravitational Wave Astrophysics”

Bela Fejer

NASA

30 June 2009 - 29 June 2012—\$89,753

“C/NOFS Satellite Studies of Electrodynamical Effects on Equatorial Spread F and Low Latitude Plasma Structure”

Silvana Martini and **Tim Doyle**

USU Research Catalyst

1 July 2009– 30 June 2010—\$19,575

“Physics-based Methods for the Nanoscale Monitoring and Processing of Foods”

Faculty Presentations & Related Professional Activities

Biology

Diane G. Alston presented “Onion Thrips Monitoring and Population Dynamics in 2009” at the Utah Onion Association Summer Tour, Corinne, Utah, 11 August 2009.

Diane G. Alston presented “Community Management of Grasshoppers and Mormon Crickets” on Utah Public Radio Pioneer Day Special, Logan, Utah, 23 July 2009.

Diane G. Alston presented “Sustainable Home Gardening: Protecting Native Insects” at the Central Utah Gardens Educational Program, Orem, Utah, 18 July 2009.

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

The following papers were presented at the annual meeting of the Ecological Society of America meeting, Albuquerque, New Mexico 2-7 August 2009.

Glenda M. Yenni* and **Xiao Xiao***. “The Relative Importance of Negative Frequency-Dependent Growth In Species-Rich Communities.”

Felisa A. Smith, Alison G. Boyer, James H. Brown, Daniel P. Costa, Tamar Dayan, Alistair Evans, **S.K. Morgan Ernest**, Mikael Fortelius, Larisa E. Harding, Kari Lintulaakso, S. Kathleen Lyons, Richard Sibly, Juha Saarinen, Jessica Theodor, and Mark Uhen. “Size Matters: Examining Patterns of Maximum Body Size of Mammals Over Time and Space.”

Katherine M. Thibault, Ethan P. White, S. K. Morgan Ernest, and Allen H. Hurlbert. “Multimodality in Avian Size Distributions across Spatial Scales.”

Chemistry & Biochemistry

Lisa M. Berreau attended a NIH Study Section Chair Orientation Meeting, Chicago, IL, 25 August 2009.

Lisa M. Berreau chaired the NIH F04A Graduate Fellowship Panel (Chemical and Bioanalytical Sciences) in Washington, D.C. 18-19 June 2009.

Lisa M. Berreau presented a keynote lecture titled “Ligand Effects on the Chemistry of Synthetic Complexes of Relevance to Nickel-containing Enzymes” at the 42nd IUPAC Congress, Glasgow Scotland, 2-7 August 2009.

Lisa M. Berreau presented a seminar titled “Ligand Effects on the Chemistry of Synthetic Complexes of Relevance to Nickel-containing Enzymes” at the University of St. Andrews, St. Andrews, Scotland, 8 August 2009.

Stephen E. Bialkowski, Oluwatosin O. Dada**, and **Prakash R. Joshi**** presented a poster titled “Finite Element Analysis Predicts Features in Photoacoustic Spectroscopy Signals” at the 15th International Conference of Photoacoustic and Photoacoustic Phenomena, Leuven, Belgium, 19-23 July 2009.

Stephen E. Bialkowski, Oluwatosin O. Dada**, and **Prakash R. Joshi**** gave an oral presentation titled “Pulse Laser Excited Photoacoustic Spectrometry of CdS_xSe_{1-x} Doped Silica Glasses” at the 15th International Conference of Photoacoustic and Photoacoustic Phenomena, Leuven, Belgium, 19-23 July 2009.

Sean Johnson gave an oral presentation and presented a poster titled “Crystal Structure of the RNA Helicase, Mtr4” at the 2009 EMBO Conference on Helicase and NTP-Driven Nucleic Acid Motors, Les Diablerets, Switzerland, 27 June – 2 July 2009.

Prakash R. Joshi** and **Stephen E. Bialkowski** presented a poster titled “Photoacoustic Lens Spectrometry in Nanoliter Cylindrical Sample Cells” at the 238th American Chemical Society National Meeting and Exposition, Washington D.C., 16-20 August 2009.

Prakash R Joshi**, **Oluwatosin O Dada**** and **Stephen E Bialkowski** presented a poster titled “Pulse Laser Excited Photoacoustic Spectrometry of CdS_xSe_{1-x} Doped Silica Glasses” at the 237th American Chemical Society National Meeting and Exposition, Salt Lake City, UT, 22-26 March 2009.

Geology

D. Forand, J.P. Evans, and **S.U. Janecke** presented a poster titled “Insights into San Andreas Fault Geometry and Deformation in the Cajon Pass Drill Hole, California” at the Southern California Earthquake Center Meeting, Palm Springs, California, September 13-15, 2009.

Mathematics and Statistics

Mark E. Fels presented a talk titled “Superposition Formulas For Exterior Differential System” at the 25th Nordic and 1st British-Nordic Conference of Mathematicians held in Oslo, Norway, 8-11 June 2009.

Piotr Kokoszka presented an invited talk titled “Testing the Stability of the Functional Autoregressive Process” at the NSF-NBER time series conference held at UC Davis, California, September 2009.

Piotr Kokoszka presented an invited talk titled “Residuals in the Functional Linear Model and Their Applications” at the Annual Meeting of the Statistical Society of Canada held in Vancouver, Canada, June 2009.

Piotr Kokoszka presented an invited talk titled “Functional Time Series” at a Colloquium held at UC Davis, California, April 2009.

Piotr Kokoszka presented an invited talk titled “Discriminating Between Change Points and Long Memory” at a Colloquium held at San Francisco State University, California, April 2009.

David Brown hosted a workshop on Discrete Mathematics for Utah middle and high school teachers. Workshop title: Let G be a Graph. 6 June 2009. Sponsored by NSF (National Science Foundation) and IAS (Institute for Advanced Studies).

Adele Cutler presented a plenary lecture titled “Random Forests” at useR!, in Rennes, France, 9 July 2009.

Zhi Qiang Wang presented an invited talk titled “Global Bifurcation Results for Nonlinear Schrodinger Systems” at the inaugural Pacific Rim Mathematical Association (PRIMA) Congress, special session on Partial Differential Equations, Sydney, Australia, 6-10 July 2009.

Zhi Qiang Wang presented a plenary talk titled “Global Bifurcation Results for Nonlinear Schrodinger Systems” at the International Conference on Variational Methods (ICVAM - II) held at The Chern Institute of Mathematics, Tianjin, China, 17-22 May 2009.

Zhi Qiang Wang presented a Colloquium talk titled “Global Bifurcation Results for Nonlinear Schrodinger Systems” at the Institute of Mathematics, Chinese Academy of Sciences, Beijing, China, 13 May 2009.

Zhi Qiang Wang presented a Colloquium talk titled “Global Bifurcation Results for Nonlinear Schrodinger Systems” at Tsinghua University, Beijing, China 6 May 2009.

Physics

Bruce Gentry, Matthew McGill, Geary Schwemmer, Michael Hardesty, Alan Brewer, **Thomas Wilkerson**, Marcos Sirota, Scott Lindemann, & Floyd Hovis. “Recent Advances in Doppler Lidar Instrument Technology at NASA’s Goddard Space Flight Center”, International Geoscience and Remote Sensing Symposium (IGARSS)-2009 in Cape Town, South Africa.

Tom Wilkerson, Alan Marchant, Bill Bradford, Cordell Wright, Tom Apeadale, Eve Fowles, Allen Howard, and Tom Naini. “SPIE Optics and Photonics meeting in San Diego “VisibleWind™: A rapid-response system for high-resolution wind profiling”, San Diego, California, 2-6 August 2009.

Charles Torre presented a paper titled “Symbolic Computation for Gravitational Physics I”, at the 25th Pacific Coast Gravity Meeting, University of Oregon, Eugene, OR, March 2009.

The Center for Atmospheric & Space Sciences

The following papers were presented at the 2009 Joint Assembly held in Toronto, Ontario, Canada, 24-27 May 2009.

Janet U. Kozyra, S. E. Gibson, G. de Toma, Barbara A. Emery, Terry G. Onsager, **Jan J. Sojka**, and B. J. Thompson “All Solar Minima are not Alike: Consequences at Earth.”

Robert W. Schunk “The Current Status and Challenges for Upper Atmosphere Models.”

Jan J. Sojka, Michael J. Nicolls, Craig Heinselman, and John Kelly “PFISR Observations of Ionospheric and Joule Heating During CIRs.”

The following papers were presented at the IAGA 11th Scientific Assembly held in Sopron, Hungary, 8-23 August 2009.

Bela G. Fejer “Ionospheric Prompt Penetration Electric Fields.”

Bela G. Fejer “Quiet-Time Variability of Low Latitude Ionospheric Plasma Drifts.”

Ludger Scherliess, **Robert W. Schunk**, and **Donald C. Thompson** “The USU GAIM Physics-Based Data Assimilation Model: Recent Developments and Results.”

The following posters were presented at the CEDAR Meeting held in Santa Fe, New Mexico, 28 June - 2 July 2009.

Jonathan Snively and **Michael J. Taylor** “Observation and Modeling of OH Airflow Temperature and Intensity Perturbations by Mesospheric Gravity Waves.”

Michael J. Taylor, Pierre-Dominique Pautet, L. C. Gardner, C. Price, S. Abe, H. Yano, and P. Jenniskens “Airborne Image Measurements of Elves Over Southern Europe.”

Vince Eccles, Don Rice, **Jan J. Sojka**, R. D. Hunsucker, and William John Raitt presented a poster titled “Weather Effects on the D-Region Electron Density” at the 2009 Joint Assembly held in Toronto, Ontario, Canada, 24-27 May 2009.

Ludger Scherliess presented an invited tutorial titled “The Morphology, Dynamics, and Variability of Low- and Mid-Latitude TEC” at the 2009 International Heliophysical Year (IHY)-African SCINDA Workshop, Livingstone, Zambia, 6-13 June 2009.

Jan J. Sojka presented a talk titled “Long-Term Evolution of the Geospace Climate” at the Heliophysics Summer School 2009, Boulder, Colorado, 22-29 July 2009.

Jan J. Sojka was a co-convenor of a session titled “CEDAR Electrodynamics Thermosphere Ionosphere Modeling Challenge” at the 2009 CEDAR Meeting, Santa Fe, New Mexico, 28 June - 2 July 2009.

Jonathan Snively and **Michael Taylor** were co-convenors of a session titled “Small-scale Dynamics of the MLT: Observation, Modeling and Theory” at the 2009 CEDAR Meeting, Santa Fe, New Mexico, 28 June - 2 July 2009.

Bela G. Fejer was reappointed a member of the NASA Geosciences Management Working Group (GMOG).

Bela G. Fejer worked with scientists at the GFZ German Research Centre in Potsdam, Germany, 6-10 July 2009.

Bela G. Fejer was named a member of the Organizing Committee of the International Living with a Star Meeting to be held in Ubatuba, Brazil, 4-9 October 2009.

Bela G. Fejer presented an invited paper “Ionospheric Prompt Penetration Electric Fields” at the IAGA Meeting held in Sopron, Hungary, 24-29 August 2009.

Faculty Publications
undergraduate*; graduate**

Biology

S.K. Morgan Ernest, Thomas J. Valone, and James H. Brown. 2009. Long-Term Study and Manipulation of a Chihuahuan Desert Ecosystem. *Ecology* 90: 1708.

Leigh C. Latta IV*, **Ryan P. O'Donnell***, and **Michael E. Pfrender**. 2009. Vertical Distribution of *Chlamydomonas* Changes in Response to Grazer and Predator Kairomones. *Oikos* 118(6):853-858.

Charles A. Price, Kiona Ogle, **Ethan P. White**, and Joshua S. Weitz. 2009. Evaluating Scaling Models in Biology Using Hierarchical Bayesian Approaches. *Ecology Letters* 12: 641-651.

Chemistry & Biochemistry

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