

The Department of Chemistry and Biochemistry Utah State University

SPRING 2006

Dear Alum:

Spring has come to Logan, and we have sent our most recent group of graduates out into the world. Graduation ceremonies were conducted separately in each College, which made for a more intimate and friendly atmosphere, as compared to the very large ceremonies in past

years in the Spectrum. Our Department graduated 17 undergraduates this year. I had the good fortune to teach many of them this past spring as they completed their Physical Chemistry requirement, and was highly impressed with their intellect and their work ethic. They are going to make us proud of them as they progress through their careers. The dedication of these students was reinforced at the Department's Honors Ceremony in April, where many of their faculty mentors complimented them as they came up to the podium to receive their awards. It was a particular pleasure to honor this year's Outstanding Alumnus: after receiving his BS and PhD (1982) degrees from our Department, Carl Wittwer has gone on to a notable career which successfully bridges academics and industry.

As you know, this Department continues to place a premium on undergraduate research. Four of our undergraduate researchers presented posters on their



projects at the University's April Student Showcase. John Fisher, Jonathan Gardner, Rebecca Mitchell, and Michael Yurth all put together very nice presentations. Elizabeth Smith received an Eccles Undergraduate Research Scholarship for her project on "Mechan-

istic study of PP-1, a catalytically promiscuous enzyme" with mentor Alvan Hengge.

Likewise, Stephen Bialkowski's student, Matt Jorgensen, received this scholarship for his project developing a "Photothermal spectrometric method for detection of environmental pollutants". Sara Huefner, Douglas Holt, and Derek Price received College of Science Undergraduate Research Minigrants.

And speaking of honors, we were proud that Alvan Hengge was named this year's Outstanding Faculty Researcher in the College of Science. This makes the sixth consecutive year that this award has gone to a member of this Department. The College's designee as Outstanding Undergraduate Research Mentor was Lisa Berreau, a fitting recognition of her efforts in this direction. Tom Chang was awarded tenure, and promotion to Associate Professor, in recognition of his contributions to teaching and research. I was intrigued at Vernon Parker's talk on campus, in which he outlined



- Merrill Library Demolition
Spring 2006



Web edition with color photos is available at:
www.chem.usu.edu/pages/alumni.html

some of the research that had earned him last year's Wynne Thorne research award. He is really holding the feet of some fundamental notions of physical organic chemistry to the fire. Alex Boldyrev spent part of his sabbatical year at PNNL, collaborating with his experimental colleagues, and Stephen Bialkowski spent the Spring semester in Slovenia, working on a Fulbright project.

The Department is witnessing a bit of a turnover of faculty. Ann Aust announced her retirement, effective this summer. Ann is one of the most senior members of our Biochemistry faculty, and was a Trustee Professor. She had recently moved over to the Research Office where she had served as Associate Vice President for Research. Rick Holz has accepted an offer to Chair the Chemistry Department at Loyola University in Chicago, and will be moving his family over the summer. We will also be losing a valued staff member. Miriam Felton and her husband will be moving to Salt Lake City to take a new position in a more urban environment.

It was an interesting experience to have a flock of some 75 eighth graders from Bear Lake Middle School (Montpelier, ID) descend upon the Department in April. With the help of our Undergraduate Chem Club, we were able to give them a brief tour of the building and even show them some simple chem experiments with "pizzaz". Who knows, maybe we started a future Chemistry Nobel Laureate along their career in our field.

As I look out over the campus, I am reminded of the continuous state of growth. The new dormitory and learning center complex is nearing completion, right outside our windows, next to the Alumni Center. And the old Merrill Library has disappeared, to be replaced at the moment by a large crater. If I didn't know better, I would think a meteor had found its way to Logan. We look forward to the new building that will inevitably rise to take its place on what is one of the most beautiful campuses in the country. and with that, on behalf of the entire Department, please accept our hope that you have a pleasant and

luxurious summer. (And lastly, we would welcome any news about you, either personally or professionally, for inclusion in our next newsletter.)

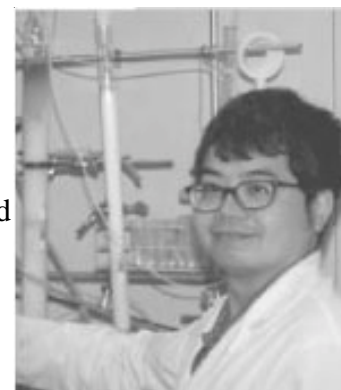
With kindest regards,



FACULTY HONORS



- **Lisa Berreau** was recognized as the College of Science's Outstanding Undergraduate Research Mentor.



- **Tom Chang** was awarded tenure and promoted to Associate Professor.



- **Alvan Hengge** was named the College of Science's Outstanding Faculty Researcher.

Faculty Achievements in 2005

Steven Aust is a member of the Editorial Boards of Applied and Environmental Microbiology and Biochemical Pharmacology, and serves on NSF's Advisory Panel for Metabolic Chemistry.

Lisa Berreau served as a panel member for NIH's Minority Biomedical Research Excellence program, and was named a member of the Editorial Advisory Board for Dalton Transactions. She chaired sessions of the Inorganic Reaction Mechanisms Gordon Conference and was an invited speaker at Pacificchem.

Stephen Bialkowski spent the Spring semester in Slovenia, at Nova Gorica Polytechnic, working on a Fulbright project.

Alex Boldyrev had his work on boron-gold clusters appear on the cover of an issue of the Journal of Physical Chemistry.

Tom Chang has been invited to write a review article for *Curr. Opin. Med*, and a chapter in a volume dealing with his research on aminoglycoside antibiotics.

Alvan Hengge presented his work at international meetings: the Isotopes Conference in England, and the Latin American Conference on Physical Organic Chemistry in Brazil. He also published a chapter in a volume dealing with Isotope Effects.

Joanie Hevel received a CURI grant for her project dealing with asbestos-induced apoptosis of human lung cells.

Rick Holz was funded by NSF for his research on novel antibacterial targets. He presented some of his work at the Gordon Research Conference on Metals in Biology and an International Conference on Bioinorganic Chemistry.

Vernon Parker made a research presentation at the Latin American Conference on Physical Organic Chemistry in Brazil.

Lance Seefeldt served as an ad hoc member of the NIH Study Section on Biochemistry and Biophysics of Membranes, and the USDA Plant Biochemistry Panel. He spoke at the 12th International Conference on Biological Inorganic Chemistry.

Phil Silva carried out field studies in Ames, IA, as well as measuring particles emanating from fireworks in Utah.

Inaugural Professor Alex Boldyrev Explores Gold's Hidden Properties

Recently promoted Physical chemist Alexander Boldyrev was honored as an inaugural professor by a reception in his honor at the President's home, followed by a presentation of his research featured in *The Journal of Physical Chemistry*.



(left to right) Steve Scheiner, Professor Boldyrev, Joyce Albrecht and President Stan Albrecht



Dmitry Zubarev and Eldon Koyle are student researcher's in Boldyrev's lab

ALUMNI NEWS

Darrell Lynn Gallup (PhD 1979) has transferred to Houston as a result of the merger between Unocal and Chevron. He works as a consulting chemist in the Oilfield Chemistry & Field Applications Group, where he supports international operations. He holds 49 U.S. and numerous foreign patents, and is the author of 65 papers.

Dawson Chuang (MS 1981) works as a Clinical Lab Chemist with Quest Diagnostics in California.

Aleksey Kuznetsov (PhD 2004) is currently carrying out research as a Humboldt Scholar at the Humboldt-Universität zu Berlin, where he is working toward a Privat-Dozent degree.

Dick van der Helm, former Cross Research Professor at the University of Oklahoma, will be paying tribute to **Tom Emery**, former faculty member in this Department. van der Helm will discuss some of Tom's scientific contributions at his Opening Lecture at the Biometals Symposium this Summer.

ALUMNI LINK



<http://www.chem.usu.edu>

- **Alumni**
 - **Alumni Newsletter**
 - **Alumni Database**
 - **Alumni Achievement Award Nominations**

Please send along news of your career, your personal life, anything that you would like to share with fellow alumni. Just tear off the last sheet in this newsletter and put in the mail or submit your information electronically through the **Alumni Database**.

THE R. GAURTH HANSEN SEMINAR SERIES

The R. Gaurth Hansen Seminar was presented by Paul Ludden, Professor of Plant and Molecular Biology and Dean of the College of Natural Resources at the University of California-Berkeley. Professor Ludden is recognized as one of the leading microbial biochemists in the world, and has made seminal research contributions in three distinct areas of microbial research: regulation of nitrogenase activity, biosynthesis of the iron-molybdenum cofactor of nitrogenase, and microbial metabolism of carbon monoxide.



Dr. Ludden met with students to present "Reflections on Careers in Science" and discuss careers and graduate school over lunch with students.



His formal presentation to faculty, visitors, and students: "NifB - A Radical SAM Enzyme Required for Synthesis of the Iron-Molybdenum Cofactor of Nitrogenase"

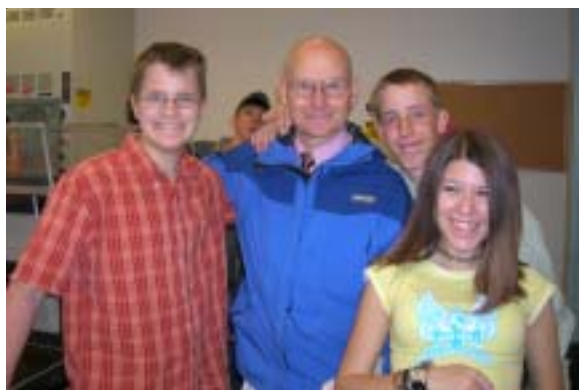
NMR FACILITY ACQUISITION

Our NMR Facility has acquired a new JEOL EXC-300 NMR instrument. It arrived in a 40-foot truck and was unloaded before the truck driver realized that he couldn't turn around in front of our building. In the end it took about 2 hours and a couple of snow shovels to get it out. The JEOL and the BRUKER NMR instruments are available for use by USU researchers and students for data collection. The NMR Facility can also accommodate users from the private sector. For more information contact NMR Facility manager, Dr. Piotr Dobrowolski.



CHEM CLUB

This spring our Chem Club played an active role in hosting Bear Lake Middle School students by organizing the lab experiences for their visit



Bear Lake Middle School Students
and Principal Bruce Belnap



Sara Huefner with BLMS Students



Trevor Nielson
Valerie Harris
Elise McKenna

COMMENCEMENT 2006

DOCTORAL DEGREES

Jeff M. Boyd

Major: Biochemistry
Major Professor: Dr. Scott A. Ensign
Dissertation: Mechanistic Studies of the Enzymes Involved in Bacterial Acetone and Propylene Oxide Metabolism
Position: Postdoctoral Fellow, University of Wisconsin-Madison

Tariq Mosleh

Major: Chemistry
Major Professor: Dr. Ann E. Aust
Dissertation: Modulation of Intracellular Glutathione Through Efflux and Decrease in Synthesis in Human Lung Epithelial Cells upon Asbestos Exposure and the Role of Glutathione in Reactive Oxygen Species Production and Apoptosis

Priyadarshini Pande

Major: Biochemistry
Major Professor: Dr. Ann E. Aust
Dissertation: Mechanisms of Crocidolite Uptake in Human Lung Epithelial Cells and the Role of Signaling Pathways in Crocidolite-Mediated Apoptosis in Human Lung Epithelial Cells
Position: Postdoctoral Fellow, Dr. Joan Hevel, Utah State University

Ravi Rai

Major: Chemistry
Major Professor: Dr. Cheng-Wei Tom Chang
Dissertation: Design and Synthesis of Novel Aminoglycoside Antibiotics with Activity Against Aminoglycoside-Modifying Enzymes
Position: Postdoctoral Fellow at Organix Inc. Boston, Massachusetts

Jinhua Wang

Major: Chemistry
Major Professor: Dr. Cheng-Wei Tom Chang
Dissertation: Design, Synthesis, and Structure Activity Relationship Study of Novel Pyranmycins, Kanamycin Analogs, and Trehalose Derivatives
Position: Postdoctoral Fellow, Ohio State University

MASTER'S DEGREES

Amy L. Fuller

Major: Chemistry
Major Professor: Dr. Lisa Berreau
Thesis: Divalent Manganese Chemistry of Tripodal N_3O^- and N_4^- Donor Chelate Ligands: Relevance to Oxalate-Degrading Enzymes



Jammi McClead and
Gabe Velazquez

Kerensa Sorensen-Stowell



Dariusz Sliwa and Ewa Szajna-Fuller

GRADUATING SENIORS

Musstafa Al-Shemali(Fall Graduation)

Eric Brimhall-Cum Laude

Grant Butler-Cum Laude

Dustin Campbell

Alex Curtis

Scott Dowling

David Justin Ego

John Fisher – Magna Cum Laude

Ren Gonzalez

Brett Hamilton – Magna Cum Laude

Carson Holt – Cum Laude

Darin Humphreys – Cum Laude

Meredith Malnar

David Moulton – Cum Laude

Joshua Schliesser – Cum Laude

Sloan Thunell (Fall Graduation)

Eric Vawdrey

Talina Watts – Cum Laude

Honors in Chemistry and University Studies

Michael Yurth

2006 AWARDS

Dept of Chemistry & Biochemistry

THOMAS M. FARLEY FRESHMAN CHEMISTRY AWARD

1. Keith F. Blonquist
2. Manuel I. Diaz Martinez
3. Douglas K. Demille
4. Cole A. Gibbons
5. Casey R. Winger

DIVISION OF ANALYTICAL CHEMISTRY AMERICAN CHEMICAL SOCIETY AWARD

Deric Holden

GARTH L. LEE UNDERGRADUATE SCHOLARSHIP AWARD

- | | |
|----------------------|-------------------|
| 1st Year | Casey R. Winger |
| 2 nd Year | Douglas E. Holt |
| 3 rd Year | Elisabeth Pound |
| 4 th Year | Brett A. Hamilton |

HARRIS O. AND ELEANOR Y. VAN ORDEN ENDOWED SCHOLARSHIP AWARD

Ryan J. Campbell

THE IRVING CONDIE FROST ENDOWED SCHOLARSHIP AWARD

Deric Holden

MAESER-BAUER UNDERGRADUATE SCHOLARSHIP AWARD

Deric Holden
Elizabeth A. Smith

THE AMERICAN INSTITUTE OF CHEMISTS FOUNDATION UNDERGRADUATE AWARD

John T. Fisher

THE R. GAURTH HANSEN, PH.D. ENDOWED SCHOLARSHIP AWARD

Elizabeth A. Smith

OUTSTANDING GRADUATING SENIOR IN THE DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Jonathan M. Gardner

**MAESER-BAUER GRADUATE TEACHING ASSISTANT
AWARD**

Laura Buelow Jared Hardman

CHEMISTRY AND BIOCHEMISTRY ALUMNI AWARD

Ewa Szajna-Fuller Ravi Rai

THE MARJORIE H. GARDNER TEACHING AWARD

Melissa Beighley

D.A. GREENWOOD MEMORIAL AWARD IN BIOCHEMISTRY

Sanghamitra Mitra

**THOMAS F. EMERY RESEARCH SCHOLAR MEMORIAL
AWARD IN BIOCHEMISTRY**

David Wampler

**THE GEORGE H. AND BILLIE BUSH EMERT SCHOLARSHIP
AWARD**

Jeran K. Stratford



Mary Farley and Prof John Hubbard presenting the Thomas M. Farley Freshman Handbook Award

**ALUMNI ACHIEVEMENT
AWARD**

USU Alumni who have made significant contributions in Chemistry and Biochemistry

**Carl T. Wittwer: BS in Chemistry, 1977
PhD in Biochemistry, 1982**



Dr. Carl Wittwer and Steve Scheiner
"I'd forgotten how humorous chemists are.
Thank you for reminding me"

A reception was held to honor Dr. Carl Wittwer, after which he presented his research in a Seminar titled "A Tale of Academics and Industry: Real-time DNA Analysis". He talked about his early training at USU, and how it influenced his scientific career. The talk proceeded to discuss the scientific advances he has made in DNA detection methods, and how he has turned this into a successful commercial venture. Dr. Wittwer developed rapid polymerase chain reaction (PCR) techniques that perform DNA amplification in 10-15 minutes. He introduced many innovations and techniques that are used worldwide in real-time PCR instruments.

But there is more to Dr. Wittwer than just his work. While at Utah State, he studied mime performance under Ron Ross and was part of a troupe that gave several performances at the Lyric Theatre. He also enjoys juggling and running the mountain ridges around his home.



Cole Gibbons, Manuel I. Diaz Martinez, Casey Winger, Douglas DeMille, and Keith Blonquist



Prof. Phil Silva and Deric Holden



Elizabeth Smith and Dr. Steve Scheiner



Prof. Lisa Berreau and Ryan Campbell



Prof. Lisa Berreau and John Fisher



Casey Winger and Lila Lee



Jonathan Gardner and Prof. Steve Aust



Jared Hardman, Laura Buelow,
and Prof. Joan Hevel

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Ravi Rai and Dr. Steve Scheiner



Melissa Beighley and Prof. Vernon Parker



Jeran Stratford and Prof. Scott Ensign

USU STUDENT SHOWCASE

Featuring Undergraduate Research



Michael Yurth
Faculty Mentor: Lance Seefeldt
“Probing a Putative Water Channel in Nitrogenase”



John Fisher
Faculty Mentor: Lisa Berreau
“Synthesis and Ni(II) Coordination Chemistry of a N_3O (Carboxylate)-Donor Ligand Containing Hydrophobic Appendages”



Rebecca Mitchell
Faculty Mentor: Alvan Hengge
“Mechanistic Studies of the Histidine Nucleophile Class of Acid Phosphatases”

Jonathan Gardner (Not Pictured)
Faculty Mentor: Steve Aust
“The Fate of Iron Released from Heme Degradation by Heme Oxygenase-1”

BENEFACTORS FOR 2005

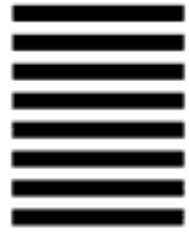
We are very grateful to the following:

Alliant Techsystems Community Investment Foundation
R. Carl Bachman
Lisa M. Berreau
Stephen Bialkowski & Agnes Chartier
Alexander I. Boldyrev
Robert S. Brown
Michael D. Cameron
Val. D. Campbell
Chao Chen & Shao Shen Mai
Roberta E. Clement
Don & Cynthia DeBethizy
Durrell Duce
Thomas Keith Eccles
George H. & Billie Bush Emert
Brandt L. Esplin
ExxonMobil Foundation
Joseph & Tanya Evans
Alvan C. & Maribeth Evensen-Hengge
Dennis J. Fife
Darrell L. Gallup
Alonzo H. Handy, III
Anna Lou Hansen
Lars P. Hansen & Grace Tsiang
Peter & Lori Jeppson
Wendell L. & Sharlene M. Jolley
Nolan & Marian Mangelson
Theodore E. Mifflin
Richard & Lavina Olsen
Vernon & Monica Parker
Pfizer Foundation
Vincent L. & Audrea Rees
Rutter Foundation
Shell Oil Company Foundation, Inc.
Delmont King Smith
Spiricon
Daniel & Lina Teng
Dr. R. J. Tesi
Harris O. & Eleanor Van Orden
Robert B. & Christine Wardle
Arthur & Mary Wittwer
Carl Wittwer

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USU Degree(s) _____ Year(s) _____ Major(s) _____

Other Degree(s) _____ Year(s) _____ Major(s) _____

Profession/Employer _____

We are interested in any news about yourself, your career, your family, etc. that you would care to share with other alumni. Submit the information via <http://www.chem.usu.edu/alumni> or detach and mail, postage paid.

Is there someone you would like to nominate for the **2007 Alumni Achievement Award**? Please write a brief outline of accomplishments of your nominee above, detach and mail, postage paid.