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Newsletter - Spring 2011

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Message from the Chair

Spring and Growing Pains

Greetings from the Department of Chemistry at Colorado State! Although Spring has come and largely gone in Fort Collins, we are just now publishing the Spring edition of the newsletter. As you are undoubtedly aware, springtime in the Rockies is a period of large and closely spaced meteorological oscillations between summer and winter, where blizzards and blistering heat can be merely days (hours?) apart. The Department has also been experiencing a time of change, growth, and a bit of uncertainty. This spring we recognized the dedicated and long-term service of our faculty members who retired in May, Profs. Oren Anderson, Gary

Maciel, and Steve Thompson. Now with all three having emeritus status, we look forward to continued interactions with these eminent and well-respected members of our community. We simultaneously welcome our newest faculty member, Dr. Delphine Farmer, an environmental chemist who joins an outstanding cohort of junior faculty in the Department, the majority having been added in just the past 3 years. This summer also marks the 18th summer of our NSF-sponsored Research Experiences for Undergraduates (REU) program. Under the new direction of Profs. Amy Prieto and Matt Shores, the Department's REU program will host 17 students from around the country (including 5 from CSU), who will engage in independent research projects with faculty mentors over a 10-week period. Amy and Matt are the third set of directors that has led this highly successful program, which began in 1994. Other changes include the renovation of our large lecture halls, which are being updated for the first time since the building was finished in 1971. Part of the remodel includes 3D depictions of molecules that will line the walls of both lecture halls as well as installation of modern audio and projection systems and up-to-date periodic tables of the elements. The Department will also embark on a long term strategic planning process over the next year as we seek to provide updated and relevant graduate and undergraduate curricula as well as to examine new directions in which the Department could grow over the coming years. Possibilities include offering online classes, a combined BS/MS degree, multidisciplinary professional masters programs, and programs of study and/or course offerings in nanoscience, addictions chemistry, chemical biology, and environmental chemistry.

As we head into summer, the rejuvenation period on a university campus, I am encouraged to embrace our department's current growing pains as an opportunity for us to develop and evolve, to become an even better department that more fully meets its constituents' needs and represents the ever changing and expanding field of chemistry. As with physical growing pains, it is explicitly the reshaping of ourselves that causes unnerving twinges and anxiety, but also allows us to expand and mature. So as the people, coursework, degree programs, and research interests in the Department change, I am optimistic that these are truly cause for celebration, signs of bigger and better transformations to come.

Honors and Accomplishments



Professor **George Barisas** was recently named a recipient of one of the 2010-2011 **Jack E. Cermak Advising Awards**.

George has advised students from five different departments at CSU; and was recognized as an advisor

that clearly allows his students to blossom as individuals, to find their own path, and follow it.

Ms. **Claire Filoux**, a third year graduate student in Prof. Tom Rovis' research group, was selected to receive the **ACS Division of Organic Chemistry Graduate Fellowship**, sponsored by Genentech.

The award consists of \$26,000, which includes travel money for Ms. Filoux to attend and present a poster at the 42nd National Organic Symposium, to be held at Princeton University in June 2011.

Professor **Debbie Crans** was selected as one of the **CSU 2011 Best Teacher Award** recipients.

Each year the CSU Alumni Association and the Student Alumni Connection encourages students, alumni and faculty and staff to submit nominations for our Best Teacher awards, and this



year, Debbie was nominated by students for this honor.



Professor Nancy Levinger was named a 2011 Fellow of the American Association for the Advancement of Science.

This honor recognizes Nancy's pioneering research on the dynamics of liquids in confined environments and how those environments affect the

chemistry, physics and biology of liquid phase molecules.

Mr. **Alejandro Trujillo**, a third year graduate student in Prof. Debbie Crans' research group, received the second place poster prize at the International Vanadium Symposium in Japan. Mr. Trujillo also received a poster award at the Metals in Medicine Gordon Conference this past summer.

Professor **Branka Ladanyi** and Professor Emeritus **Lou Hegedus** were elected to the 2010 class of **Fellows of the American Chemical Society**.



Branka has been at CSU since 1979. Her research interests center on theoretical modeling of dynamics and inter-molecular structure in liquids, supercritical fluids, molecular clusters, solid/liquid interfaces, and self-assembled structures such as reverse micelles.

She has been very active in the Physical Division of the ACS, and has organized symposia at national ACS meetings.

Lou started his career at CSU in 1971 as an assistant professor and established a world-renown research program in organic synthesis and organometallic chemistry. He mentored dozens of graduate students and postdocs over the years and was an active member of the organic



division of ACS. Even after his retirement in 2006, he continued to serve as an associate editor of the Journal of the American Chemical Society, retiring from that duty just last year.

Honors and Accomplishments



Professor **Chuck Henry** had one of his recent articles highlighted in the journal *Analytical Chemistry* in a section devoted to the top papers in microfluidics.

Chuck's multidisciplinary research in separations science continues to garner recognition in far corners of the world, as he has established an ongoing collaboration with universities in Thailand.

Professors **Chuck Henry** and **Amy Prieto** were honored at Colorado Cleantech Industry Association's inaugural "Celebrate Cleantech Research" event in May. This event recognized outstanding cleantech research and commercialization in the State's university labs.

Prof. Henry received the **Excellence in Water Technology Commercialization** award. As co-founder and CEO of Advanced MicroLabs LLC, he was recognized for his work to commercialize a low-cost, rapid "lab-on-a-chip" device which uses integrated circuit technology to identify various components in a range of samples, including air, drinking water and blood at a significantly lower cost than traditional methods. AML is currently working to bring an innovative on-line monitoring sensor to the industrial clean water market. Henry is also working with Boulder-based Crystal Diagnostics to develop a technology to detect pathogenic bacteria in waste and recreational waters, and with Lumiere on new technology for rapid detection of food-borne pathogens.

Professor **Prieto** received the **Excellence in Storage Technology Commercialization** award for her contributions to energy storage. She is part of the university's Clean Energy Supercluster commercialization arm, Cenergy. In 2009, Prieto co-founded Cenergy's first startup company, Prieto Battery Inc., a company expected to commercialize a non-toxic battery technology up to 1,000 times more powerful and 10 times longer lasting and cheaper than traditional batteries. The development of this technology could revolutionize the transportation, communication and energy storage industries. **Sarah Fredrick,** a second year graduate student in Prof. Amy Prieto's research group, will receive a prestigious **National Science Foundation Predoctoral Fellowship** for her work on the development of nanoscale batteries.

These awards are highly competitive and provide support for three years of graduate study to individuals who "demonstrate their potential to successfully complete graduate degree programs in disciplines relevant to the mission of the NSF."

Professor **Amy Prieto** was named as this year's recipient of the **ExxonMobil Solid State Chemistry Faculty Fellowship** from the Division of Inorganic Chemistry of the ACS.



The award includes an

unrestricted grant of \$10,000 and will be formally presented at the Fall 2011 ACS meeting in Denver. Notably, this fellowship "recognizes young scientists who have made substantial contributions to the discipline of solid-state chemistry and have the potential to emerge as leaders in the field."

Amy is the second CSU chemistry faculty member to win this prestigious award. Prof. Peter Dorhout received this recognition from the ACS in 1996.

The American Chemical Society (ACS) student chapter at Colorado State University was selected to receive Honorable Mention Award for its activities conducted



during the 2009-10 academic year.

This places the chapter in the top 30% of all chapters in the country. All award winning chapters were recognized at the 241st ACS National Meeting in Anaheim, CA in March 2011.

2010-2011 Chemistry Undergraduate Awardees

ACS - Hach Land Grant Fund Scholarship Scott Martin

Benjamin Melzer

Kristin Olsson

Amanda Pluntze

ACS Undergraduate Analytical Chemistry Award

Anthony Silvestri

ACS Undergraduate Award in Inorganic Chemistry

Ethan Hill

Jennifer Dawn Alexander Scholarship

David Daley

American Institute of Chemists Award Kaitlin Hellwig

Chemistry Undergraduate Scholarship Lindsey Nordhues Megan Watters

Cornell Stanhope Scholarship Fund

Emily Tully

CRC Press General Chemistry Achievement Award **Rachel Visage**

Graduate Teaching Assistant Award

Joshua Blechle Sandra DePorter Wesley Hoffert Jessica Joslin

Rueben G.Gustavson Award - Junior Christopher Nickell

Clifford C. Hach Memorial Scholarship Mikaela Cherry

Jessica Egner Kenzie Moore **Kelsey Schulte**

Merck Index Award Brendan Young

ACS - Hach Land Grant Fund Scholarship recipient Benjamin Melzer and Chemistry Chair Ellen Fisher (not shown: Scott Martin, Kristin Olsson and Amanda Pluntze)

Dr. Harry Puleston Memorial Scholarship Brittany Barrett

Undergraduate Outreach Award

Kate Douglas **Emily Strausbaugh** Sarah Ward

Undergraduate Research Assistant Award

Jarrad McKay – Senior Rachel Speights - Senior Andrew Roddam - Junior Elie Schuchardt – Junior Kellie Woll – Junior Garrett Wheeler - Sophomore Ryan Whitcomb - Sophomore Hannah Feldman – Freshman Tiffany Wong – Freshman

G. H. Whiteford Scholarship

Ryan Clark Josephine Cunningham Kristin Olsson





Dr. Harry Puleston Memorial Scholarship recipient Brittany Barrett with from left Prof. Melissa Reynolds and Mrs. Pauline Puleston



(not shown: Hannah Feldman, Andrew Roddam, Elie Schuchart and Tiffany Wong)

Graduate Fellowship Recipients



2011 Maciel Fellowship Awardees (Left to Right): Kevin Whitcomb (advisor Alan Van Orden), Michael Cuddy (advisor Ellen Fisher) and Jacob Nite (advisor Amber Krummel), with Chemistry Chair Ellen Fisher.

Gary E. Maciel Fellowship

This fund provides fellowships for graduate students studying in the field of physical chemistry. It was established to honor the career of Colorado State chemistry professor, Gary E. Maciel. Since its establishment in 1998, over 30 awards have been given to support students through the Maciel Fellowship.

Criteria: Must demonstrate outstanding academic achievement, show prospective promise in chemical research, where possible in human medical application, and have financial need.

Rodney Bush Fellowship in Organic Chemistry

Created by his wife, Cheryl, this fellowship is in memory of Rodney, who specifically recruited CSU students for Procter & Gamble. This is the fifth year of the Bush Fellowships.

Criteria: First year organic chemistry graduate student with a minimum 3.0 undergraduate GPA.



2011 Bush Fellowship Awardees (Left to Right): Daniel Henderson (advisor Tom Rovis), Nicholas White (advisor Tom Rovis) and Stacie Newton (advisor Travis Bailey), with Department Chair Ellen Fisher. Not pictured: Nathan Bair (advisor Bob Williams)

CSU's Chemistry Ranks Among Top 50 in the Nation

U.S. News and World Report has named the graduate program in the Department of Chemistry at Colorado State University one of the top 50 programs in the country.



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The Department Welcomes...



Dr. Delphine Farmer (Fall 2011)

Dr. Farmer will join the Chemistry Department at CSU in the fall of 2011. Dr. Farmer is an atmospheric chemist with interests in ecology, climate change and air pollution. She uses techniques from analytical and physical chemistry (spectroscopy, mass spectrometry) and builds instruments to measure how reactive trace gases and particles move between forests and the atmosphere. These measurements allow thoughts on how forests affect climate and air quality on local, regional and global scales - and how human perturbations are affecting forest ecosystems. Delphine's research interests are focused on interactions between atmospheric chemistry and ecological processes and their implications on regional air quality, forest ecology and climate change. She is particularly interested in developing new techniques for measuring biosphere-atmosphere exchange - on soil, leaf, plant and forest ecosystem-scales - of reactive chemical species in both the gas and particle phases. Many of these chemical species contain nitrogen and other nutrients limiting plant growth. She received her PhD from the University of California Berkeley, where her graduate research focused on the biosphere-atmosphere exchange of reactive nitrogen oxides between the atmosphere and a ponderosa pine forest. Dr. Farmer completed her NOAA Climate and Global Change Postdoctoral Fellowship at the University of Colorado, where she is currently a Research Scientist II with both the department of Chemistry & Biochemistry and CIRES (Cooperative Institute for Research in Environmental Studies).



2011 Chemistry Alumni Reception Fall ACS Conference - Denver

Gather with friends, colleagues, faculty and fellow alumni at the 2011 Chemistry Department Alumni Reception. Join us as we honor Dr. Bob Williams, recipient of the 2011 ACS Ernest Guenther Award in Chemistry of Natural Products, and Dr. Amy Prieto, 2011 ACS Inorganic Division ExxonMobil Solid State Chemistry Faculty Fellowship recipient.

Monday, August 29, 2011

5 -7 p.m.

CSU Denver Center 475 17th Street, Suite 200 Denver CO

RSVP by August 22 at www.rams5280.colostate.edu



A Fond Farewell...

As we come to the end of another school year, the Department of Chemistry bids farewell to three longtime faculty members. Professors Oren Anderson, Gary Maciel and Steve Thompson will all retire this summer, after a combined 118 years of service to Colorado State University and its students.

Through their significant contributions to education and research, each has left an indelible mark on the chemistry program at Colorado State University. We are indebted to these outstanding faculty members who have dedicated so many years to the advancement of chemistry, and have provided our students with exceptional research and educational opportunities for many years.

As they start a new chapter in their lives, we wish them well on the next stage of their journey. And although they are retiring and will leave the ranks of full-time professor, we are honored they have all been selected for Emeritus Professor status and will continue to remain involved in our program.



Oren Anderson joined the Chemistry department in 1974, after serving as an assistant professor for two years at the University of Michigan Ann Arbor. In his more than 30 years at CSU, Professor Anderson made significant contributions in the area of structural chemistry, with a strong emphasis on single crystal X-ray diffraction. In addition, for many years, Professor Anderson managed the X-ray facilities in Chemistry and served as the director of the X-ray Crystallography Consortium, which brings together researchers from across the Front Range, including faculty and students from undergraduate institutions such as Fort Lewis College in Durango as well as other neighboring institutions such as the University of Wyoming and the University of Colorado. In this capacity, Professor Anderson has had tremendous impact on structural chemistry research far beyond that occurring at CSU.

Perhaps even more than his outstanding research contributions, Oren has played a key role in education during his career at CSU. Over his long career at CSU he took a special interest in undergraduate education, serving for many years as Chemistry's academic advisor to the Honors program. He taught numerous courses across the undergraduate chemistry curriculum, from the most basic general chemistry to upper division inorganic courses and the capstone senior seminar. In 2003, he received the College of Natural Sciences Award for Excellence in Undergraduate Instruction as well as the prestigious Willard O. Eddy Teacher award from the Colleges of Natural Sciences and Liberal Arts.

In addition to these contributions to the research and teaching missions of the department and University, Oren also served as Department Chair for 10 years (1989-1999). Under his leadership, more than a dozen faculty members were added to the department's ranks (the majority of whom are still at CSU) and the central instrument facility was expanded dramatically to include multiple instruments designed for materials research. For these contributions, among others, CSU honored him with the Oliver P. Pennock Distinguished Service Award in 2002.

Oren received his Bachelor's degree from Carleton College in 1964, his Ph.D. from Northwestern University in 1968, was a NTNF Postdoctoral Fellow at the University of Bergen, Norway from 1968-1970 and University Research Fellow at the University of Leicester, England from 1970-1972.



Gary Maciel joined Colorado State as a faculty member in 1971. His research has centered on nuclear magnetic resonance, a field that uses the magnetic properties of atomic nuclei to elucidate details of molecular structure and behavior in a wide range of samples.

In his 40 years at CSU, Professor Maciel made significant contributions in the area of nuclear magnetic resonance (NMR) spectroscopy, both theory and application. His research efforts focused heavily on the application of NMR techniques to solid state samples, environmental problems such as pollutants in soil samples, biomass conversion (i.e. development of biofuels), and analysis of thin films of a range of materials. From 1978-1990, he was the Director of the CSU NMR Center, which serviced not only CSU, but the entire Front Range community. Although the center ceased to exist in 1990, it is still recognized as having been instrumental in the development of multiple NMR

techniques and for training of dozens of students and postdocs; thus, Professor Maciel's work has had tremendous impact on the use of NMR spectroscopy far beyond that occurring at CSU and has created a legacy that will continue long after his retirement.

Gary's career at CSU has produced not only outstanding research, but also enormous contributions to the training and education of students. He has had over 60 Ph.D. and 7 M.S. students graduate from his group over the years and has served as a mentor to countless others. His efforts in both research and education have garnered numerous awards and recognition including AAAS Fellow, the ACS Colorado Section Award, the Sigma Xi/CSU Honor Scientist, and editorial board membership on several prominent journals in his field. In recognition of his work on recruiting and educating graduate students, the Maciel Graduate Fellowship was established in 1998 by a private donation. This fellowship provides continuing support for outstanding physical chemistry graduate students.

Dr. Maciel received his Bachelor's degree in 1956 from the University of California at Berkeley and his Ph.D. in 1960 from the Massachusetts Institute of Technology. He held National Science Foundation predoctoral and postdoctoral fellowships at the Massachusetts Institute of Technology and has been a special National Institutes of Health Fellow at Harvard University and Carnegie-Mellon University.



Stephen Thompson began his career at Colorado State in 1969 and has since been honored with numerous awards in recognition of his outstanding teaching, including being one of the first four CSU Distinguished Teaching Scholars, recipient of the Colorado State Board of Governors Award for Excellence in Undergraduate Teaching, the CSU Alumni Association Teacher of the Year Award, the Preston Davis Award for Instructional Innovation, the US Department of Education Mina Shaugnessy Scholar Award, and the LW Durrell Distinguished Award for Innovative Teaching Methods.

In total, he has taught over 55,000 undergraduate students in 2,500 courses and laboratories over the past 42 years at CSU. He directed the undergraduate chemistry laboratory program at CSU for many years and pioneered the development and application of Small-Scale Science methods in chemistry instruction at the secondary and post-secondary school levels. Dr. Thompson's research interests include anthocyanin pigments of plants and the chemistry of atmospheric aerosols.

As Director of the Center for Science, Mathematics, and Technology Education (2005 - 2010), Steve continued to broaden the participation of underrepresented groups in science, mathematics, and technology. Dr. Thompson is the developer of numerous innovations in teaching, learning curricula and research tools in Small-Scale Chemistry and Small-Scale Science including Labtop: An Integration of Theory & Practice (FIPSE, 2006 – 2010); Powerful Pictures: A Conceptually-based Curriculum for First-Year Chemistry (FIPSE, 2001 – 2004); The Solutions Project: Reducing the Cost of Laboratory Education (EPA, 1998 – 2001); Pollution Prevention in Community College Instructional Laboratories (EPA, 1997 – 19999); S3TAR: Small-Scale Science: Teachers As Researchers (NSF & CCHE, 1992 – 1995); and Rocky Mountain Teacher Education Collaborative (NSF, 1995 – 1999).

Stephen Thompson received his Bachelor of Science degree in Chemistry at the University of Birmingham, England in 1961 and studied at the Rotherham College of Advanced Technology in Chemistry, ARICC in 1959. He received his Ph.D. in Analytical Chemistry from the University of Birmingham, England in 1964 and was an Analytical Chemistry Post Doc at the University of Arizona in Tempe in 1966. To finance his schooling, Dr. Thompson worked as a professional fire-eater and sword-swallower in European circuses.