



Greetings from the Chair

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Greetings from a beautiful Fort Collins, Colo., where my inaugural fall semester as chair is well underway. I want to begin this letter with a special THANK YOU to Ellen Fisher, the outgoing department chair. As friends and alumni of the department are well aware, Ellen filled the role of chair through five of the toughest financial years our department and university have seen. Through her innovations and hard work, we not only survived but improved as a department. I inherit a department that is in better condition than it was five years ago and am very thankful for Ellen working hard with the rest of the team to make that happen.

Despite the tremendous progress we have made over the past several years, the last year was marked by the loss of two departmental pillars, Dr. Gary Maciel (April 4) and Dr. Mike Elliott (July 2). Both Gary and Mike had long and distinguished careers in the department. Between the two, they oversaw the graduation of many Ph.D. and M.S. students in addition to teaching literally thousands of undergraduates. Mike's loss was especially tough as he was an active faculty member at the time of his passing and an important mentor to many current junior and senior faculty members, myself included. Gary and Mike will be greatly missed but, as Mike would want, we must and will carry on to achieve new heights!

While we have faced challenging times in the last year, we also have much to be excited about. This fall we welcomed 28 new graduate students budding with enthusiasm as they embark on their graduate careers. We also welcomed two new tenure-track faculty members in Andy McNally (synthetic organic) and Martin McCullagh (computational). Finally, we have, at long last, entered active planning phases for construction of a new chemistry building with the recent release of the first allotment of state funding. More updates are coming on this exciting new development in the months ahead.

As we look forward to a bright future I must stop and say thank you to all those that have continued to support our students, faculty, and research in the Department of Chemistry. Your very generous giving has allowed us to make significant progress towards funding new endowed chairs and student scholarships. In addition, we will begin fundraising for our new building. These are exciting times and I look forward to sharing more news with you in the months and years to come.

Sincerely,

Charles S. Henry

Department Chair

Upcoming Events

Oct 30, 2014
 ChemClub Halloween

Dec 17, 2014
 Winter Recognition

Dec 19, 2014
 Graduate Commencement

Dec 20, 2014
 Undergraduate Commencement

March 23, 2015
 Alumni & Friends Reception

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Honors and Accomplishments

Associate Professor Melissa Reynolds Wins Career Award



Melissa Reynolds' quest to develop implantable medical devices that the human body will not reject has received a \$500,000 boost from the National Science Foundation. The federal agency has awarded Reynolds the **NSF CAREER Award**, to embed chemical catalysts into medical devices that interact with blood to create nitric oxide—a molecule produced by the human body to block

infections, prevent dangerous clotting and promote healthy cell growth.

The NSF Career Award is a prestigious 5-year award in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research. Melissa's project, "CAREER: Metal Organic Frameworks for Increased Nitric Oxide Duration at Medical Interfaces Plus the Development of a Biomaterials Module for Non-STEM Majors" promises to revolutionize biomedical devices and to bring fundamental biomaterials knowledge to one of our key service courses for non-science majors.

Crans Recipient of the 2015 Arthur C. Cope Late Career Scholars Award

Debbie Crans has been selected as a recipient of the **2015 Arthur C. Cope Late Career Scholars Award** sponsored by the Arthur C. Cope Fund. The ACS recognizes Debbie Crans for characterization of the structures and properties of organic vanadium complexes and applying these principles to understand the impact of different coordinated ligands on anti-diabetic activity.



CSU Speakers Bureau Includes Kristen Buchanan, Ellen Fisher, Chuck Henry, Amy Prieto, A.R. "Ravi" Ravishankara, Melissa Reynolds and Tom Rovis

Colorado State University is committed to advancing research and providing community outreach, and the CSU Speakers Bureau was launched this year to allow the public to tap into the expertise of CSU's scholars and professionals. These speakers can be utilized for media inquiries, peer discussions, speaking engagements, educational opportunities with the public and serving on boards or committees.

International Coordination Chemistry Conference (ICCC) to Come to Colorado Summer 2022

Debbie Crans and Cort Pierpont (Professor at the U. of Colorado, Boulder) went to Singapore to the ICCC and put in a bid to bring this conference to Colorado in 2022. ICCC is one of the longest-running inorganic chemistry symposia, the first being held in 1950 and every 2 years following. This conference has not been held in the U.S. for the past 30 years. Debbie will be the third woman in history to chair this event.

Professor Nancy Levinger Inducted as an ACS Fellow

Professor Nancy Levinger has been named a **2014 ACS Fellow**. In 2009, the American Chemical Society began the fellows program as a way to recognize and honor ACS members for outstanding achievements and contributions to science.

Levinger's contribution to the science/ profession: Recognized for pioneering work on spectroscopy and dynamics in condensed phases, especially molecules at liquid interfaces and in confined environments, and for development of undergraduate research opportunities.



Levinger's contribution to the ACS community: Recognized for commitment as a Division of Physical Chemistry Executive Office, especially as program chair; as a mentor and panelist in the Postdoc to Faculty Workshop Program; and to equity in national awards.

Profs. Chuck Henry and Tom Rovis were named **Fellows of the Japan Society for the Promotion of Science (JSPS)**. Profs. Elliot Bernstein, Bob Williams, and Yian Shi are previously awarded JSPS fellows in the Department of Chemistry. This program provides opportunities for researchers to conduct cooperative research with leading research groups in Japanese universities and other institutions. **Prof. Bob Williams** was also awarded a prestigious **JSPS Long-Term Fellowship** award in 2013.

Melissa Reynolds was recognized as an **Emerging Investigator in Materials Chemistry** by the *Journal of Materials Chemistry - Biology and Medicine*. The Royal Society of Chemistry publishes this special edition every three years to highlight excellent contributions by scientists in the early stages of their career.



TILT Funds "Flipped Classroom" Plans for CHEM111

The Institute for Learning and Teaching (TILT) has funded a proposal for a team, led by chemistry instructor and academic support coordinator Dr. Randy Booth, to create a new blended live-online method of instruction for the CHEM111 General Chemistry I course, planned to launch in the fall semester of 2015. "Flipping the classroom," this course will provide a small-class setting for students to gain valuable problem-solving and study skills led by the instructor; students will access course content traditionally presented in lectures through short, directed online segments. The blended approach will allow more individualized instruction, improve student success in this fundamental course, and assist students in their transition to university level academic expectations to improve overall university retention.

Honors and Accomplishments

Celebrate Undergraduate Research and Creativity (CURC) 2014 Winners Recognized

Colorado State University recognizes and honors the achievements of students in the areas of research & creativity. Students are invited to participate in a variety of events that will provide them an opportunity to showcase what they have learned through their research and creative activities. Following the Showcase, an awards ceremony recognizes all participants and honored awards winners from the various events. 2014 CURC recipients include:

Alexandra Roach (Reynolds Group) - College Honors for "Analysis of Fibrinogen Secondary Structure in Nitric Oxide-Releasing Biomaterials"

Susannah Miller (Crans Group) - High Honors for "H-NMR Analysis of Valine Uptake in Reverse Micelles as a Model for Amino Acids in Beta-Lactam Synthesis"

Steve Glade (Crans Group) - Honors for "Synthesis and Characterization of Bio-Inorganic Vanadium(V) Catechol Compounds"

Angela Ruff (Levinger-Crans Group) - High Honors for her project on "Characterization of the Interactions of Cupped Ions with the Coumarin Fluorophore"

Graduate Student Receives Alfred R. Bader Award for Student Innovation

Sandra DePorter, a 5th year graduate student in the **McNaughton lab**, has been awarded a prestigious **Alfred R. Bader Award** for Student Innovation in synthetic organic chemistry and chemical biology. The Alfred R. Bader Award is sponsored by the Sigma Aldrich corporation, and is designed to acknowledge Ph.D. research of exceptional creativity and impact. As a winner, Sandra will receive a cash prize and will present her research at the Sigma Aldrich campus.



Sandra received her undergraduate degree in chemistry from the University of Wisconsin at Madison. During this time, Sandra performed research with Professor Tehshik Yoon, focusing on the development of new copper(II)-catalyzed oxyamination reactions. As a graduate student at CSU, however, Sandra's work dramatically changed course, as she joined the McNaughton lab and focused her efforts on chemical biology-related research. During her time at CSU, Sandra worked in a number of different areas, including the development of cell-imprinted polymers for spatially controlled cell adhesion and growth, the synthesis of activated nanoparticles, and the use of bacteriophage as a nanocarrier for the targeted delivery of exogenous protein reagents to diseased human cells (the latter being recognized by this award).

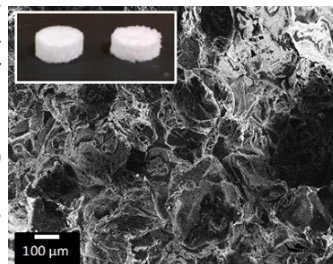
CSU Ventures Innovation Symposium – Most Innovative Posters 2014

First place – "Next Generation Nitric Oxide Releasing Biomedical Devices" – **Jacqueline Harding, Jarid Metz, Megan Neufeld, and Melissa Reynolds**; Department of Chemistry and the School of Biomedical Engineering

Third place – "Cu₂Sb Nanowire Arrays for High Power Lithium-Ion Battery Anodes" – **Everett Jackson (Prieto Group)**

Fourth-Year Graduate Students Morgan Hawker and Erin Stuckert Receive Awards

Morgan Hawker (Rickey-Fisher Group) was recently honored with the **Best Poster Award** (consisting of a \$500 cash award) at the annual **Rocky Mountain Regional American Vacuum Society (AVS) Meeting** in Denver. Morgan's poster focused on her work utilizing plasmas to create 3-dimensional bio-reactive and bio-nonreactive substrates to understand and prevent biofilm formation and potentially incorporate antimicrobial properties. A photograph and SEM image of the novel 3-D polymeric scaffolds employed by Morgan are pictured here.



In addition, **Morgan and Erin Stuckert (Fisher Group)** have received **Hoffman travel awards** from the national AVS organization to attend the annual **AVS International Symposium** in Baltimore this November, where they will both be giving oral presentations on their research.

Awards for Outstanding Oral Presentations

Congratulations to Ph.D. students **Eric (Buck) Bukovsky** and **Karlee Castro (Strauss-Boltalina Group)** for their recognition for Outstanding Oral Presentations by the ECS Nanocarbons Division at the 225th ECS meeting in Orlando in May.

The title of Buck's talk was "Structure Analysis of C₆₀(CF₃)₁₀ Isomers." The title of Karlee's talk was "Photophysics and Photochemistry of Trifluoromethylfullerene Fluorophores."



Bruce Weisman (left), Electrochemical Society Nanocarbons Division Chair, presents Outstanding Student Oral Presentation Awards to Colorado State University graduate students Karlee Castro and Eric Bukovsky at the 225th ECS National Meeting in Orlando, FL, in May 2014.

Events & Announcements

CSU Chemistry Club

Meets Every Other Monday 6:30p.m.

(1st Monday 9.8.14)

Chemistry Lobby

After several years of wandering in the renovation desert of the chemistry building, Chem Club has a new place to call home! We are pleased to announce that the undergraduate Chemistry Club is in Yates 410, next to the GenChem stockroom. Our young chemists now have a clean and modern space for their meetings, storing of their supplies, and the professional assistance of the stockroom staff next door to assist with their preparations for K-12 outreach programs.



Chem Club Halloween!

Thursday, October 30th 5:30—7:30 p.m.

Come join us for a night of

spooky fun

in the Chemistry lobby.

Come visit our booths filled with slime, drinks, bubbles, bugs, snakes, face painting and more!



The Chemistry department will once again host an **Alumni & Friends Reception** in Denver on **March 23, 2015**. Join us in recognition and celebration of students, faculty, alumni, donors and friends and their amazing contributions!

Alumni & Friends Reception

Monday, March 23 5—7p.m.

CSU Denver Center

475 17th Street • Denver, CO 80202

CLeRC Now Open!

The Chemistry Learning Resource Center ([CLeRC](#)) opened this fall to support activities and provide resources to students studying chemistry. The CLeRC supports activities such as faculty and TA office hours, tutoring sessions, open study, professional development, and various trainings and workshops. The center also provides open/reservable study space, whiteboards, textbook/reference resources, projector screen for special events, and nearby computer lab.



CONGRATS!

Each year, our undergraduate and graduate students win countless awards and are recognized for their research in chemistry. We'd like to say "**Congratulations**" in recognition of all your hard work and dedication to the field of chemistry.

Ben Peters – Accepted to the Metals in Medicine Gordon Conference. Ben also received a scholarship from the department to attend the conference and was one of the 10 students selected for a short presentation during the event.

Nuttaport Samart (Henry Group) – Successfully defended her thesis in the summer. Nuttaport coauthored three manuscripts in peer-reviewed journals and recently graduated with her Ph.D. She was a joint student between CSU and Thailand.

Pam Yapor (Reynolds Group) – Received the AGEF (Alliance for Graduate Education and the Professoriate) Extension Award

In The News

UN Panel Finds Ozone Layer on the Mend

For years, experts have warned that the Earth's protective ozone layer is shrinking. At The UN Headquarters in New York last month, **Dr. A.R. "Ravi" Ravishankara** and others delivered some good news about the fragile shield of stratospheric gas: the ozone layer appears to be recovering. This discovery was made by a panel of 300 scientists appointed by the United Nations to assess ozone depletion. Ravi helped lead the group, which has spent the past four years sifting through and analyzing ozone data and studies.

Through the work of the Montreal Protocol, and the international community's compliance, they have begun to see evidence of ozone recovery. UN officials say without the Montreal Protocol and other agreements, the level of harmful, ozone-depleting substances would have substantially increased and put humans at risk of higher rates of skin cancer, eye cataracts and other health problems.

Ravi and other members of the scientific assessment panel are expected to present their findings at the annual Meeting of the Parties to the Montreal Protocol in November in Paris.



UN Photo/Eskinder Debebe

New Chair of the Chemistry Department

Charles Henry is the **New Chair** of the chemistry department. He also holds appointments in chemical & biological engineering and biomedical engineering. He has been teaching in the department since 2002.

Before joining CSU, he was a member of the chemistry faculty at Mississippi State University. Henry received his Ph.D. in analytical chemistry at the University of Arkansas, and was an NIH postdoctoral fellow at the University of Kansas. Henry has published over 85 peer-reviewed publications and sits on the editorial advisory board for *Analytica Chimica Acta*.

The focus of his research is development of advanced tools to measure environmental impacts on human health, to enable fact-based policy decisions and improvements in occupational health. These include biosensors, electrochemical imaging, and inexpensive paper-based analytical devices for a range of applications.

State Funding to Further Drug Discovery Work at Colorado State University

The Colorado Center for Drug Discovery received \$750,000 from the Colorado State Office of Economic Development and International Trade (OEDIT) to continue to help Colorado research institutions develop new medications to fight cancer and other illnesses. The funding will be used to support the center through 2015.

Created in 2010 as part of Colorado's Bioscience Discovery Evaluation Grant Program, the Colorado State University Department of Chemistry-based center brings together industry-experienced medicinal chemistry, synthetic chemistry expertise, pre-clinical pharmacology resources, and funding to assist investigators and advance their early stage research. C2D2 currently provides chemistry services for 3 ongoing collaborations. Additionally, over the past four years, the center has provided more than \$736,000 to 25 drug discovery programs at all of the state's major research institutions. The efforts have helped researchers develop new research collaborations, create new intellectual property and obtain additional funding (~\$2.4M).

"Everything you wanted to know your freshman year, but didn't know to ask" – Dr. Randy Booth Develops New First-Year Seminar Course for Incoming Chemistry Majors



Chemistry department academic support coordinator, key academic advisor and instructor, Randy Booth, has developed a new curriculum for the Chemistry 192 – Introductory Seminar in Chemistry course and is teaching two sections of the course to incoming freshman chemistry majors this fall 2014. This course aims to support incoming chemistry majors in successfully transitioning to and becoming a member of both the chemistry department and of Colorado State University, provide direction in completing the degree, and explore ways to enhance the educational experience to become more marketable after graduation.

Why develop this course? Randy states, "this freshman seminar course has provided an excellent mechanism to facilitate some of the goals of the new departmental position of academic support coordinator to personalize education, assist in the high school to university transition, and improve student success and retention."

In The News, Cont.

Fisher Joins Office of Vice President for Research



Ellen Fisher was recently named the **Senior Faculty Advisor for Research** and will spend the next several months working with the research office. She will continue to teach courses and conduct research. "We are very excited to have Ellen join our office as part of an initiative to expand the voice of the faculty community in our planning and practice," said Alan Rudolph, CSU's vice president for research. Before joining the Office of the Vice President for Research, Fisher served as chair of the chemistry department.

Fisher's Research

Her research crosses analytical, materials and physical chemistry and focuses on understanding the fundamental chemical processes that take place during plasma processing and chemical vapor deposition.

Through her work, Fisher has improved solar cell efficiency; developed new composite nanomaterials, porous media, and next generation biomaterials; and explored environmental applications for plasma chemistry. Her research has significantly influenced the microelectronics community. Fisher's wide-ranging scholarship has also had a lasting impact on improving porous polymers for use in desalination and filtration applications; creating novel thin-film and nanostructured materials for use as protective coatings, solar cells, drug-delivery systems, and biocompatible materials; and innovative "green" chemistries that seek to reduce greenhouse gases in engine exhaust and organic contaminants in water.

"I am truly excited to join the VPR staff and provide a faculty perspective on research administration," Fisher said. "I look forward to working with Dr. Rudolph and other members of the OVPR to advance CSU's research mission."

Amy Prieto and Prieto Battery Making Batteries More Powerful

At first Amy Prieto didn't know what she was looking at. The video on the laptop screen showed a pair of hands attaching a battery to an LED, which immediately lit up. This was in March of this year, and Prieto, a chemistry professor at CSU and CEO and cofounder of Prieto Battery, was sitting in an Italian restaurant in with Derek Johnson, the company's other cofounder.

Prieto had questions. She asked if the video was yet another test. Or maybe it showed a partial version of their battery powering an LED? She was baffled. And then it suddenly clicked for her. This wasn't a test. This was real.

Prieto is at the forefront of one of the most important but least-talked-about technological frontiers. With their fast charging times and high energy density, lithium-ion batteries have revolutionized the way we live. They power our phones, tablets, laptops, and a growing number of electric and hybrid vehicles. ([Read full article here...](#))



With its porous structure and increased surface area, Prieto Battery's 3D lithium-ion battery has five times more energy density than a standard li-ion.

General Chemistry Team Participates in Provost's Academy on Instructional Innovation

In a comprehensive effort to develop and deliver courses that are informed by the best thinking about how to engage and challenge college students in the 21st century, Colorado State University has invited the general chemistry faculty team - Randy Booth, Nancy Levinger, Ben Reynolds, and Ingrid Ulbrich - to the Provost's Academy for Instructional Innovation. These select chemistry faculty members are working as a group within the chemistry department, and with faculty from other departments, to develop partnerships in a university-wide network leading to new and improved courses for our undergraduate students. "This group has already identified many ways for our large service courses to add value to students' learning," says Nancy Levinger. "Chemistry teaches such an incredibly large number of CSU students who are not chemistry majors. We want to make our courses relevant to students and help them not only to learn the content but also to gain problem-solving and study skills to help them succeed in college and beyond." Through this effort, the department has also received funding to increase the number of teaching assistants in CHEM111 recitations.

Welcoming New Faculty

Dr. Andrew McNally



Andy is a native of Liverpool in the UK and completed his undergraduate education at the University of Cambridge. After his final-year project in Professor Ian Paterson's laboratory, Andy joined Professor Matthew J. Gaunt's group in 2003 as one of the inaugural group of students. His doctoral studies focused on the use of small organic molecules to catalyse chemical reactions as well as their synergistic combination with transition metal catalysts.

Andy then gained a prestigious Marie-Curie International Outgoing Fellowship and moved to Princeton University for his post-doctoral studies in Professor David W. C. MacMillan's laboratory. There, he developed a new concept for chemical reaction discovery based on 'accelerated serendipity' that used robotics and high-throughput techniques to uncover important new transformations.

Andy returned to the UK in 2010 to Professor Gaunt's laboratory and developed catalytic C-H activation processes for the functionalization of aliphatic amines.

This fall Andy joins the faculty of Colorado State University as an assistant professor in the Department of Chemistry. His research program aims to develop methods that convert renewable and abundant resources such as biomass into valuable chemical products.

Dr. Martin McCullagh



Martin grew up and attended high school on the south side of Chicago. For college, Martin attended Emory University in Atlanta, Ga., where he obtained his B.Sc. (highest honors) in chemistry and math. From 2005-2010 Martin attended Northwestern University and received his PH.D. in computational and theoretical chemistry. In July 2011, Martin started work as a postdoctoral scholar at the University of Chicago. In May 2012, Martin was awarded the Ruth L. Kirschstein National Research Service Award postdoctoral fellowship. Martin's work focused on understanding energy transduction in DNA translocation by helicases and using biology to inspire cheaper alternative fuel sources.

Martin's interests include how energy is transduced and transferred in biological systems. Energy transduction is a pivotal step in the operation of both macroscopic and microscopic machines. The current state of the art in molecular machines is to use one of a select number of energy transducing moieties (such as azobenzene) as building blocks for larger machines. Biological machines, such as ATPases, have evolved to effectively and efficiently transduce energy in ways that are not currently understood. A thorough understanding of these motor proteins has the potential to drastically improve the field of molecular machines. Computational techniques such as molecular dynamics (MD) are invaluable resources that can help us understand these proteins. Biological machines, however, are often too large or too complex for traditional MD, thus requiring the use of multiscale and potentially multi-state coarse-graining.

At CSU, Martin's group will focus on computational and theoretical studies of protein-DNA interactions. These interactions span the gamut of cellular length scales from the cleavage of glycosidic bonds by DNA glycosylase proteins to the packing of DNA into the nucleus made possible by histone proteins. The multiscale nature of these interactions make these systems interesting and yet challenging to study. His team will use and develop cutting-edge multiscale simulation methods to address these challenges.

Alumni News

Garret M. Miyake (Ph.D. 2011 Chen Group) started his assistant professorship at the University of Colorado, Boulder, in August 2014. His research interests are in the fields of synthetic polymer chemistry and materials science. Currently, his research group is developing organic and organometallic catalysts to enable the synthesis of new polymeric materials.

Richard E. Nodlinski (B.S. 1960) completes 53 years in education at the secondary and community college levels this October, and continues to work as an adjunct in physics and applied accounting.

Michelle Sanchez (Ph.D. 2014 Williams Group) has received a prestigious Postdoctoral Fellowship for Academic Diversity at the University of Pennsylvania. The competitive scholarship seeks to attract promising researchers and educators from different backgrounds, races, ethnic groups, and other diverse populations whose life experience, research experience and employment background will contribute significantly to the academic mission.

Jamie Neeley (Rovis Group) successfully defended her thesis and has headed to **Princeton University** for her postdoc with Dr. Paul Chirik.



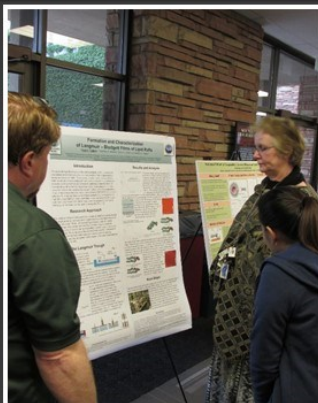
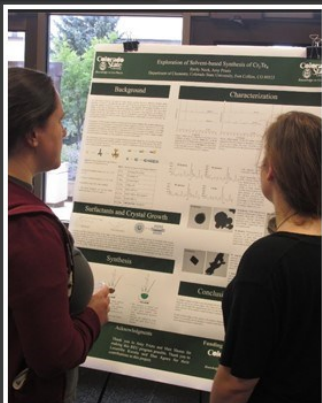
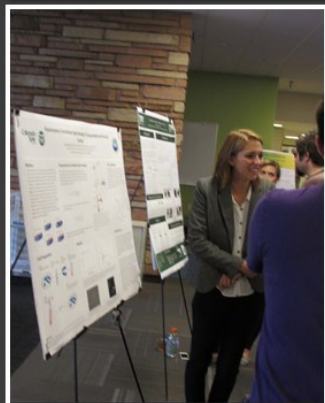
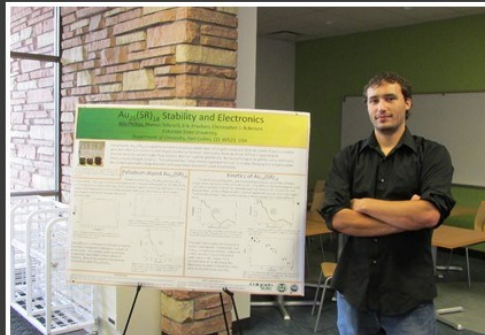
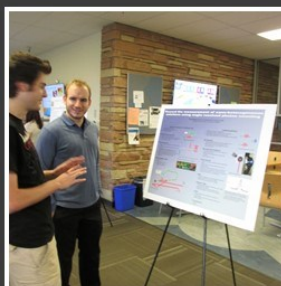
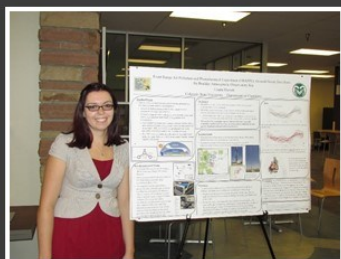
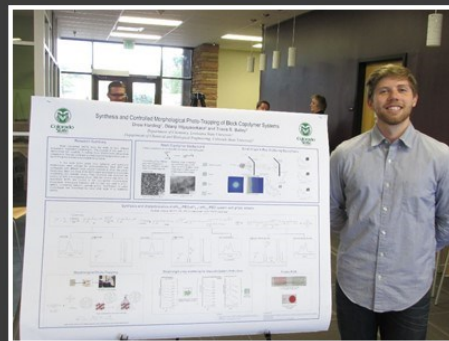
A Summer of Science

REU (Research Experience for Undergraduates)

This summer's REU students presented their research during a poster session in August.

This unique summer experience combines an enviable environment with access to world-class researchers working in all areas of chemistry.

The main focus of this 10-week summer program is the research that each undergraduate student performs under the guidance of a faculty mentor. This program provides opportunities for undergraduate students to work within the faculty mentor's laboratory and participate fully in the research group activities. The program concludes with a capstone poster presentation.



Other Summer Research

Chris Miller (Fisher Group) participated in a summer research program at **Sandia National Labs** in Albuquerque.

Fabio Fantes attended the Inorganic chemistry **Gordon Conference** for summer 2014.

Nathan Zvejnieks was admitted into the NSBRI Summer Apprenticeship Program from NASA.

Congratulations, 2013-2014 Graduates!

Doctor of Philosophy

Paul Allegretti	Aug 2014, Ferreira
Seth Anthony	May 2014, Rickey/Ladanyi
Derek M. Dalton	Aug 2013, Rovis
Stephanie R. Fiedler Gleich	Dec 2013, Shores
Todd K. Hyster	Aug 2013, Rovis
Alberto Jimenez-Somarribas	Dec 2013, Williams
Jessica M. Joslin	May 2014, Reynolds
Isil Kayiran	Aug 2013, Finke
Bryon W. Larson	Dec 2013, Strauss
Samantha R. Levine	May 2014, Wood
Travis C. McMahon	Aug 2013, Wood
Rajesh K. Nayak	Dec 2013, VanOrden
Kevin M. Oberg	May 2014, Rovis
Aaron D. Pearson	Aug 2013, Williams
Michelle Romanishan	May 2014, Crans
Douglas A. Rooke	Aug 2013, Ferreira
Michelle Sanchez	Aug 2014, Williams
Jeffrey C. Shearer	Aug 2013, Fisher
Jordan J. Stracke	Dec 2013, Finke
Joshua J. Stratton	May 2014, Borch
Brendan Tompkins	Aug 2014, Fisher
Lyndsay D. Troyer	May 2014, Borch
James B. Whitaker	Dec 2013, Strauss

Master of Science

Julie E. Denham	May 2014, Henry
Eric F. Dunn	Aug 2013, Chen
Nicole C. Escude	Dec 2013, Chen
Stephen Gatlin	Aug 2014, Reynolds
Andria Marsh	Aug 2014, Borch
Jarid M. Metz	May 2014, Reynolds
Christopher B. Moss	Dec 2013, Elliott
Penny P. Osborne	Aug 2013, Farmer
Amanda M. Pluntze	Aug 2013, Strauss
Meghan D. Schmitt	Dec 2013, Chen
Ashli R. Simone	May 2014, Reynolds
Brendan Smouse	Aug 2014, Farmer
Michael J. Wells	Dec 2013, Bailey



Bachelor of Science

Marie Berry	May 2014
Christopher J. Browning	May 2014
Ji Chun	Aug 2013
Justin M. Custer	Dec 2013*
Mengmeng Fang	May 2014*
Stephen R. Gatlin	May 2014*
Adam D. Golos	May 2014
Angella N. Greenawalt	Aug 2013*
Wilson A. Holland	May 2014
Erik M. Knudson	May 2014
Lisa D. Lindburg	May 2014
Jacob L. Meyer	May 2014
Kristin A. Olsson	Dec 2013
Cody M. Palumbo	May 2014
Blaine A. Pedersen	May 2014
Brittany M. Ramer	May 2014
Kyle E. Schachinger	Aug 2013*
Kelsey A. Schulte	May 2014*
Paul M. Skogerboe	May 2014



Brendan A. Smouse	Dec 2013*
Robin Ward	Dec 2013
Angela M. Warner	May 2014
Robert B. Weakly	May 2014
Jeremy Webb	May 2014*
Ryan K. Whitcomb	May 2014
David E. Wozniak	May 2014*

*ACS Certified

Student Research Highlights

Graduate Student Joel Kirner's Recent Paper Receives Three Honors

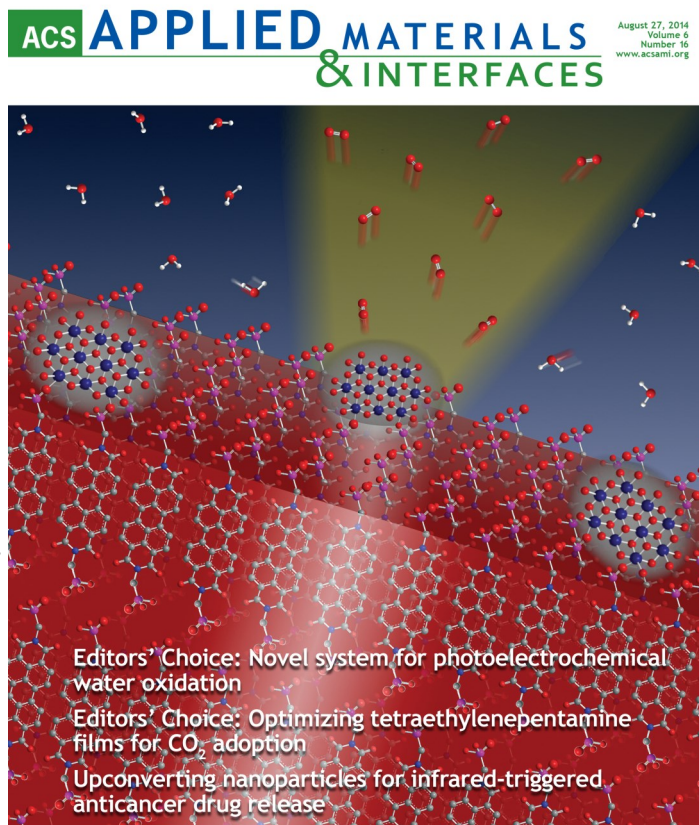
Joel Kirner's (Finke Group) recent article has earned three distinctions—"Most Read," "Editor's Choice" and a "Cover Art" selection.

Due to the growing need for clean and renewable energy, a lot of researchers are trying to develop systems to collect and store solar energy. One strategy is to harness solar energy to split water into hydrogen and oxygen, effectively storing the solar energy in chemical bonds. The oxygen and hydrogen could be stored, and ultimately burned to release the energy when desired.

The water-splitting reaction has two parts: water oxidation, and proton reduction. Our research project has focused on the water oxidation half reaction, with the goal of developing a system that will use cheap and abundant materials to collect solar energy and use it to oxidize water. We chose to make a novel organic dye to collect light energy, and coupled it to an inorganic water oxidation catalyst which is made from cheap and abundant elements. Using these materials, we were able to make a device that successfully oxidized water using light energy and an applied electrochemical bias. Our research was recently published in an article in *ACS Applied Materials and Interfaces*¹, and was selected for an ACS Editors' Choice award and featured on the journal cover in the August 27 issue.

1) Kirner, J.; Stracke, J.; Gregg, B.; Finke, R.; *ACS Appl. Mater. Interfaces*, **2014**, 6 (16), 13367–13377.

Text contributed by Joel Kirner.



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Undergraduate Mitchell Bordelon Spends Summer Conducting Research in Germany



Metal-organic frameworks (MOFs) have gathered interest amongst the scientific community in recent years. These materials, composed of metals linked together by a backbone of organic molecules, have possible applications in gas storage, catalysis, drug delivery, and proton conduction. Over this previous summer, I spent my time studying phase production differentiation among a select variety of aluminum-based MOFs in a smaller city on the very northern tip of Germany called Kiel. There I worked as a research intern through the German Academic Exchange Program Research Internship in Science and Engineering program (DAAD RISE) at Christian-Albrechts-Universität in Professor Norbert Stock's group. Alongside the doctoral student Thomas Homburg, I was able to differentiate between the minute differences in the synthetic processes of three varying MOFs.

The techniques I learned in Germany have bolstered my ability to work in Assistant Professor **James Neilson's group** here at CSU. I have expanded my knowledge of hydrothermal syntheses along with X-ray diffraction, thermogravimetric, NMR, IR, and absorptivity characterization techniques that I can apply to my work at CSU. I have already begun to reference ideas related to MOFs that will help me attempt to incorporate a photosensitive organic molecule into a layered superconductor. I highly value my time in research because it will provide me with the skills and ideas to create something that has never been seen before.

Text contributed by Mitchell Bordelon.



Faculty Research Highlight

Dr. Robert Williams

During the past two years, Prof. Williams has co-founded a new biopharmaceutical company, **Cetya Therapeutics**, located in Fort Collins. Cetya has recruited a highly talented management team including local Fort Collins resident Clifford Hendrick, former vice president of operations & general manager of more than twenty years at Genzyme. Cetya's chairman of the board, Dr. Ron Martell, hails from San Francisco and was previously director, president & CEO of NeurogesX; before that, he served as CEO, president and COO of Poniard Pharmaceuticals, and he also served as Senior VP at Imclone Systems. Cetya is currently trying to raise a Series A venture financing round to clinically develop a drug for the treatment of AML (acute myelogenous leukemia) based on patented, licensed compounds made in the Williams lab under NIH sponsorship that are potent inhibitors of class I histone deacetylase enzymes. The NIH grant from the National Cancer Institute has sub-awards to Prof. James E. Bradner's laboratory at Harvard Medical School and Prof. Olaf Wiest at Notre Dame. The scientific founders of Cetya also include veterinarian oncologists Profs. Douglas Thamm and Dan Gustafson of the CSU Flint Animal Cancer Center, theoretician Prof. Olaf Wiest of the University of Notre Dame, and Prof. Douglas V. Faller of Boston University Medical Center. Professor Williams' laboratory has also been extensively collaborating with Prof. Douglas V. Faller's lab to develop a small-molecule drug for the treatment of scleroderma. A second start-up company, Sapiientia, based in Philadelphia, whose goal is to develop the scleroderma agent, has been co-founded by Prof. Williams along with his physician brother, Dr. William V. Williams, who currently serves as VP of exploratory development at Incyte Pharmaceuticals.

In 2013, Prof. Williams was awarded a prestigious JSPS Long-term Fellowship Award that sponsored a seven-month sabbatical in Japan, where he and his family lived in Yokohama. During this time, Prof. Williams delivered over sixty lectures at thirty-five Japanese Universities and twenty-five Japanese pharmaceutical companies. He established new collaborations with Prof. Hiro Suga of Tokyo University, Prof. Toshiyuki Kan of Shizuoka University (who served as JSPS host), and Prof. Sachiko Tsukamoto of Kumamoto University. The extensive collaboration with the Tsukamoto lab, which has been ongoing for almost 10 years, involved two field collection trips to identify new terrestrial and marine fungi that produce new and novel anti-cancer natural products. Prof. Williams joined the Tsukamoto group on Mt. Aso to collect terrestrial fungi and then to the southern tip of Kyushu, to collect marine fungi. This project, funded by a National Cancer Institute grant (recently renewed for five years), has a sub-award to Prof. David H. Sherman's laboratory at the University of Michigan. In addition, fungal mycologist Prof. Jens Frisvad of the Technical University in Denmark, and evolutionary geneticist, Prof. Martin Kreitman of the University of Chicago, have joined forces through this five-way collaboration to elucidate the molecular genetic basis for the biosynthesis of a large family of prenylated indole alkaloids with anti-cancer activity. During his sabbatical in Japan, Prof. Williams was fortunate to re-unite in Tokyo with recent Nobel Laureate Prof. Ei-ichi Negishi, Williams' undergraduate research advisor. Prof. Williams also celebrated his 60th birthday (in Japanese, "kanreiki") in Japan on February 8, 2013 and later, (September 28, 2013) was honored with a symposium organized by Williams group alumni at CSU to mark this milestone as well as initiate the fundraising activities for the Williams Endowed Chair in Chemistry, conceived and introduced by Dean Jan Nerger.

And for fun, Williams professionally recorded twelve rock tunes that were recently released on iTunes as "Dr. Bob's Strat'Osphere." Several tunes feature Provost Rick Miranda on bass guitar.



with Prof. Negishi, Tokyo 2013



JSPS host, Prof. Kan Shizuoka University; marine fungal collection, Kyushu; Mt. Aso with Prof. Tsukamoto

Giving to Chemistry

The Leslie Diverdi Scholarship

Before retiring in 2009, **Prof. Leslie DiVerdi** spent two decades at Colorado State University promoting the field and inspiring legions of undergraduates – many of whom started out unsure of whether they would pursue the sciences at all – to chase their passions. Soon, her name will once again fill the hallways.

The Professor Leslie DiVerdi Scholarship, initiated by Joseph DiVerdi, current CSU faculty member and her longtime partner, is on its way toward endowment and will soon yield yearly awards for chemistry majors.

For the last several years, Leslie has experienced early-onset dementia; she lives in good comfort but is detached from this part of her past. "We're celebrating her name and what she has meant here," Joseph DiVerdi said. "She was the chief academic advisor for the department and, to a great extent, was the backbone of general chemistry at CSU. She always wanted to work with undergraduates and bring them up."



Fellow CSU chemist and University Distinguished Teaching Scholar Nancy Levinger has also supported the scholarship and says she'll always remember Leslie's compassion, kindness, and influence on young people. "She had deep knowledge of the material and endless energy for her work," she said. Levinger also knows just how much impact programs like this can have. "This scholarship is near and dear to my heart because it focuses on student performance in physical chemistry, which is often challenging for chemistry students," she said. "It honors excellent performance and encourages our students to excel in this important and very active area of chemistry."

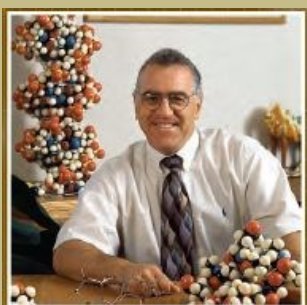
Jan Nerger, Dean of the College of Natural Sciences, said DiVerdi was an "influential and beloved presence on campus." "She created profound experiences for our students, and the time is right to further cement her name in CSU lore and help today's chemistry majors begin to make their marks in the field," Nerger said.

Megan (Cooney) Crownholme (BS 2003) echoed the same sentiments in a recent email to faculty. *"She was my first chemistry teacher at CSU. There were 200 people in my class but she gave me a lot of individualized attention, which I really needed. She was my advisor and a major influence in my decision to change my major from engineering to chemistry. Dr. Levinger was a big influence in "pushing" me to become a teacher, and so the chemistry department really shaped my future."*

For information about how to donate, go to: https://advancing.colostate.edu/DiVerdi_Scholarship.

Campaign for New Williams Endowed Chair

The College of Natural Sciences has begun a new campaign to establish the Dr. Robert Williams Endowed Chair in Chemistry.



Dr. Williams has been dedicated to involving many students in his research through the Williams Research Group, training successive generations of scientists who are making their own marks in bio-organic chemistry and biosynthesis. His students have gone on to careers as scientists at pharmaceutical companies and as educators. "I love watching students become scientists," Dr. Williams has said. "By the time they are done here, they're ready to take on the world, and that's very satisfying."

This chair will allow Colorado State University to recruit to the College of Natural Sciences an established organic chemist or chemical biologist who is an outstanding scholar, gifted teacher, and exceptional researcher who has made significant contributions to his or her field of study. Dr. Williams has personally pledged 10% of the total needed to establish the chair.

Please join us and Dr. Williams with a gift to support the Dr. Robert Williams Endowed Chair in Chemistry, and continue the legacy of teaching, mentoring, and groundbreaking research conducted by Dr. Williams, his colleagues, and his students.

Contributions can be made to the Dr. Robert Williams Endowed Chair in Chemistry through the CSU Foundation: <https://advancing.colostate.edu/WILLIAMSCHAIR>

Through the generous gifts of chemistry alumni and friends, we are able to offer support to our students as well as resources to our faculty. Financial assistance through scholarships is very important to our students, and in many cases allows them to stay in school. In addition to improving learning opportunities, gifts also play a critical role in providing faculty the needed resources to perform cutting-edge research.

We are excited to be able to provide our readers with more information about these scholarships, endowed chairs, and events that support the growth of the chemistry department at Colorado State University. Please visit www.chem.colostate.edu/giving/ for more information about the many projects supporting Chemistry.

To make a gift, please visit

<https://advancing.colostate.edu/CNS/CHEM/GIVE/>



News from the CIF

Central Instrument Facility

We are excited to now have a fixed Column in the department newsletter, through which we hope to give you a snapshot of the latest developments in the CIF. It's been an exciting summer for the CIF, which kicked off with the launch of our new summer school initiative. About 30 students (from chemistry, physics and engineering) participated in two one-credit classes with a practicum. Major topics were advanced materials analysis and electron imaging, with the latter taking advantage of our brand-new transmission electron microscopy (TEM) laboratory. Due to the large interest, we anticipate offering these annually with rotating topics (NMR, materials, spectroscopy, imaging, etc.), so stay tuned for the next edition's announcement. We are also excited to complement our academic summer school with intense three-day workshops on specialized topics (starting with electron diffraction methods for materials analysis), and to open enrollment to participants from other universities as well as industry.

Since the installation of the JEOL-2100F TEM, Dr. Roy Geiss (our electron imaging and spectroscopy specialist) has made great progress on the initial testing of its various components. Although the instrument is not yet performing at its acclaimed level, a nice collection of high-quality images, diffraction patterns and EDS spectra have been produced for a number of research groups, including those of Dr. Amy Prieto (see Image 1) and Dr. Chris Ackerson (chemistry), and Dr. Jorge Rocca (electrical and computer engineering).

The CIF was also the beneficiary of some one-time funding for new equipment in the past several months, from various sources. New capabilities include dynamic light scattering, fluorescence spectroscopy, fluorescence microscopy (see Image 2) and magnetism and physical properties measurements (PPMS). Also, the PMF donated an older, but still quite nice mass spectrometer (Thermo LTQ) to the CIF self-service MS lab, replacing the much more antiquated, but heavily used, LCQ Duo instrument. Finally, important upgrades were also made to old NMR software, and a 400NMR console and magnet were acquired to replace the quenched 300NMR magnet and to add limited solid-state NMR capabilities in the near future.

We encourage all of you to come by from time to time to see the CIF in action, discuss additional instrument needs and any concerns or suggestions you may have. This news column is one of several recent efforts the CIF is undertaking to increase visibility and promote communication between the facility and its users. More news updates can be found on our website (cif.colostate.edu) as well as by joining our Linked-In group.

Cheers,

The CIF team

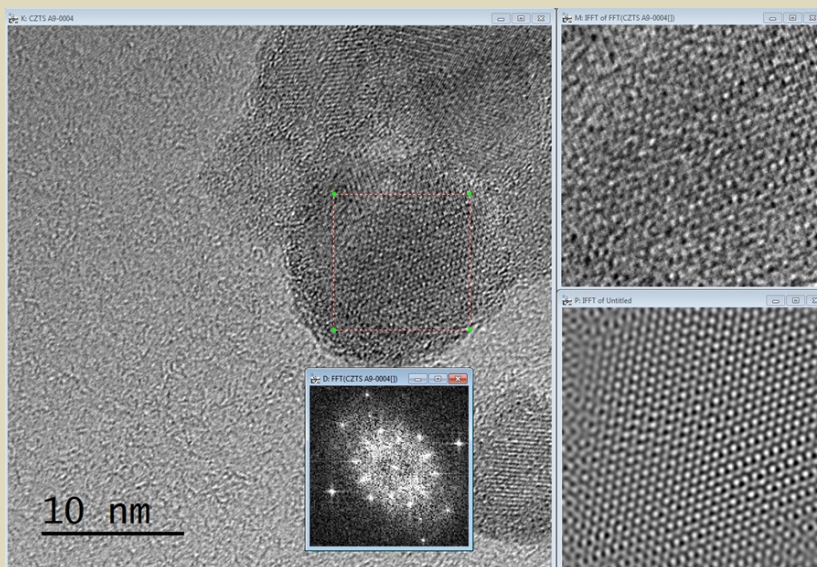


Image 1 - $\text{Cu}_2\text{ZnSn}(\text{S,Se})_4$ nanoparticles, which are part of the energy research program of Dr. Amy Prieto. The research is being conducted by Dr. Lasantha Korala Kankanamalge. Images were taken with the new 2100F TEM in the CIF.

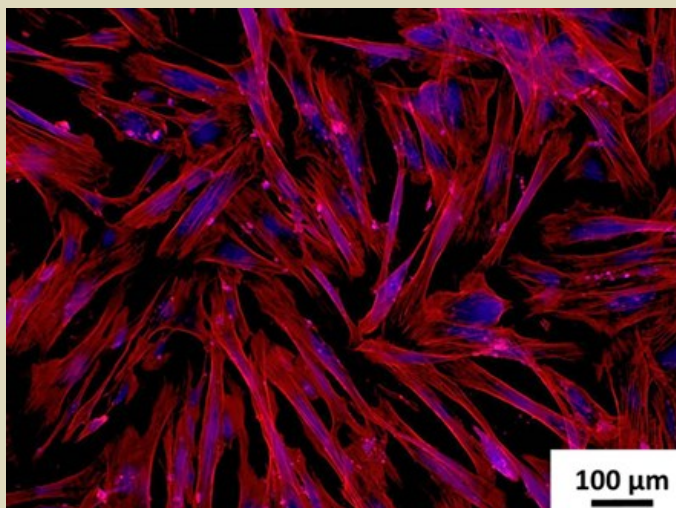
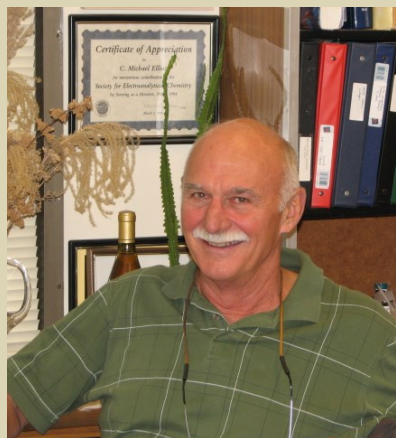


Image 2 - Human-derived fibroblasts, stained with DAPI and RFP, as part of the biomaterials research program of Dr. Melissa Reynolds. Image taken by Dr. Dori Pegalajar-Jurado, with Olympus IX73 fluorescence microscope.

In Memoriam



Our dear friend and colleague **Professor C. Michael Elliott** passed away July 2, 2014, at the age of 64. Prof. Elliott joined Colorado State as a faculty member in 1981, and served as department chair from 1999 to 2003. With more than 30 years of experience in electron-transfer reactions, photochemistry, and electrochemistry, much of his research focused on transition metal complexes with renewable energy applications in redox-active polymer materials, materials with novel electronic properties, redox catalysis, and sensors. He served as CSU co-director for the Colorado Renewable Energy Collaboratory, Center for Revolutionary Solar Photoconversion since 2008.

Mike loved spending time with students, and through his contributions to student education he graduated over 40 Ph.D. and M.S. students and mentored countless others,

including undergraduate research students as well as high school students who often spent time in Mike's labs. He was well known for spending countless hours in the lab, performing experiments of his alongside his students, and was always willing to talk to anyone about their science or his. Virtually every member of the department has sought Mike's scientific guidance at some point or another. His amazing passion for teaching and research has been recognized by numerous distinctions and awards including AAAS Fellow, College of Natural Sciences Professor Laureate, Outstanding Science Mentor Award, NAS Inter-Academy Exchange Fellow, and the Phillips Petroleum Award for Excellence in Research and Teaching.

Dr. Elliott received his bachelor's degree in 1971 from Davidson College and his Ph.D. in 1975 from the University of North Carolina Chapel Hill. He completed his postdoctoral work at Stanford University under JP Collman, and was an Assistant Professor of Chemistry at the University of Vermont Burlington prior to joining Colorado State University.

In addition to his many contributions to science, education and service, Mike was well known for his forthright and honest approach to all things in life. His wry sense of humor, intense dedication and no-nonsense attitude will be sorely missed. He was more than a faculty member; he was a pillar and leader in the Department of Chemistry. With his passing, the department acknowledges the deep and lasting loss of a truly valued educator, scientist, colleague and friend.

Contributions in honor of Mike Elliott can be made through the CSU Foundation:

<https://advancing.colostate.edu/MICHAELELLIOTTSCHOLARSHIP>