Chemistry Department Newsletter

In this issue:

Welcome to the Chemistry Department's Fall semester newsletter. We hope you enjoy reading about the exciting things going on in the department.

Chemistry Club Resurgence

The Colorado State University-Pueblo Chemistry Club in recent years was dwindling in membership and activity until Fall 2018 where a resurgence has revived the club's activity and growing membership from four to over thirty members. To date, the CSU-Pueblo Chemistry Club has provided community outreach activities, science related field trips, and networking opportunities for club members.

Outreach activities include providing chemical demonstrations with mini-lectures to supplement local high school chemistry courses, sponsoring ACS Program-In-A-Box webinars, and interacting with other clubs on campus, such as the Biology Department's Med-Sci Club. A recent "demo day" at East High School (Pueblo, CO) was very successful and the Club was enthusiastically invited to come back soon. The initial goal was to do one outreach activity per month and to rotate among the local high schools.

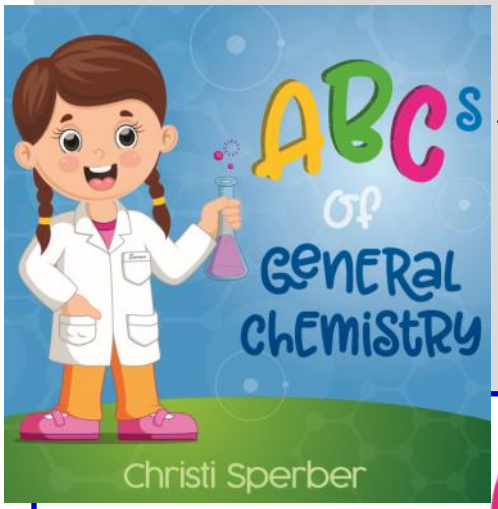
Field trips completed or planned include touring the historic Mollie Kathleen gold mine in Cripple Creek, CO, and a trip to the Museum of Nature and Science in Denver. Pueblo is a historic center of mining activity in southeastern Colorado with a rich history of lead, silver, and gold mining operations, thus providing ample opportunities for future outdoor events.

Networking events have been focused on permitting club members to see chemistry in action and learn about potential employment opportunities and the requisite skills and education. Tours of the local wastewater treatment plant, an engineering company, a lab in Denver, and a nearby cement plant have been completed or planned.

Alumni Notes

Christi Sperber (née Vergunst) graduated in 2014 from CSU-Pueblo with a M.S. in chemistry and a B.S in biology. She did her Master's research with Dr. Matthew Cranswick in bioinorganic chemistry to develop and understand molecular models of the active site of acetylene hydratase. Christi was a graduate teaching assistant while at CSU-Pueblo and she loved teaching her students about how awesome chemistry is. She is now a stay-at-home mom with her beautiful daughter, Emma, and she wanted to introduce Emma to the wonderful world of science. There are many nerdy, science books out there, and of course Christi has gotten most of them for Emma; however she noticed that there were not many chemistry-related books that catered to babies and toddlers, and the ones that she did find were inaccurate. How was this possible?! She decided she wanted to write an ABC book about the concepts of general chemistry. Even though she has taught general chemistry for years, and has helped teach science to students of all ages, she still had more to learn.

In her book, *The ABC's of General Chemistry*, there are three "levels of learning" for each letter. The first learning level (Level 1) of each page is the header/title and picture, which says what each letter stands for and an example picture: ex. - "F is for Freezing" with a picture of a snowflake. This level is for babies, to get them familiar with various words and topics that are commonly found in general chemistry, and to gain their interest with pretty pictures. The next level of learning is designed for toddlers and elementary kids, and it is the definition for each letter. For example, the book's definition of freezing states that "Freezing is caused by the loss of heat by an object and the temperature falling below the object's freezing point". Defining a concept is fairly straightforward, but making sure that it is simple enough for children to understand proved to be a slight challenge – a topic that seems basic for a chemist is still abstract to a child and Christi had to be aware of that when writing the definitions. The third level of learning is for children, and adults, of all ages; this part is the description of each concept. For freezing, the description talks about how snowflakes are formed. Forming the descriptions turned out to be the most interesting and the most challenging part of writing the book. Christi had to create a connection between these foreign concepts and something that children could relate to. Researching each topic showed her how learning never ends, no matter how long you have been studying a certain subject; Christi never knew how snowflakes were actually formed, but now she does!



Through this project, Christi gained such a deeper understanding about how chemistry is all around us and if you only focus on chemistry and how it pertains to examples learned in the classroom, then you are missing out on all the endless learning opportunities that can be found beyond the classroom.

Dr. Cranswick is proud to see Christi continuing her love of chemistry by reaching out to the most impressionable of all young scientists and their parents. *The ABC's of General Chemistry* and future books are sure to be a hit among the Chemistry faculty and future generations of parents and young scientists.

When finalized you can expect to find *The ABC's of General Chemistry* available from Amazon.

Faculty Focus

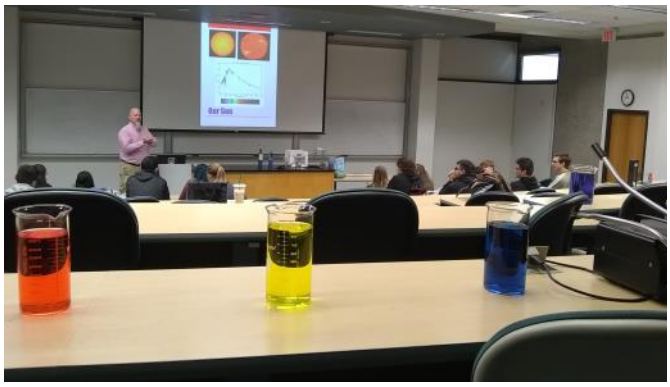
Dr. Kristy Proctor is a Colorado native who has dedicated her 29 year career to teaching, research, and administration within Colorado public higher education (CSU-Pueblo). She earned her PhD in analytical chemistry at Colorado State University (Fort Collins), and BS degrees in chemistry and biology at the University of Southern Colorado. Her academic career includes 16 years of administrative leadership as the Department Chair of Chemistry, Assistant Provost, Dean of the College of Science & Mathematics, Interim Dean of Graduate Studies & Research, and Presidential Fellow, at CSU – Pueblo. Dr. Proctor has also been honored to serve twice, as a *Distinguished Visiting Professor* of Chemistry at the United States Air Force Academy (USAFA) during her career.

Dr. Proctor is passionate about advancing quality and access to higher education as tools to transform and improve the lives of students within our community. She has dedicated much of her career to securing funds to enhance research and educational opportunities for all students (over $4.8 million), including and especially those underrepresented in career fields that are destined for growth and societal impact in the future (healthcare, STEM, education, etc.). She has mentored over 22 undergraduate and masters' students in research, leading to over 40 technical presentations and 6 publications, most of which included students as co-authors/ presenters. Dr. Proctor is currently working on chemical education research using modern pedagogies to improve student learning and pass rates in general chemistry and analytical chemistry courses. Kristy enjoys spending her leisure time outside hiking, golfing, playing tennis, and spoiling her baby, Miss Annie, *the most photographed poodle in the U.S.*

"Chemistry is Out of this World" - Chemistry Day 2018

The theme for National Chemistry Week in 2018 was "Chemistry is Out of this World". The Chemistry Department embraced this theme as it hosted 80 high school students and their teachers for Chemistry Day 2018 at CSU-Pueblo. Participating students came from four high schools: Canyon City, Centennial, East, and Fowler. The morning was filled with four Faculty and Chemistry Club led activities that in someway connected to the National Chemistry Week theme, which was then followed by a pizza lunch and exploration of just how much science is in science fiction.

Activities included students making their own comets, exploring how colors/light can be used understand stellar composition, and even a little bit of rocket science as students explored the thermodynamics or rocket propellants. In the activity "Mars and Back" students gained understanding of the role of gravity and the consequence of spending extended periods in zero gravity on biochemical processes important in bone remodeling and synthesis. As part of "What Can Color Tell Us about Stellar Composition" students learned about absorption and emission spectra, and what this can tell us about presence of different elements.



Usually Chemistry Day is concluded with lunch and chemistry demos, but this year students enjoyed their pizza will participating in "Sci or Fi? Space Chemistry in Movies". Dr. Jonathan Velasco created an almost game show atmosphere as he quiz students about the science and not-so-scientific aspects of popular science fiction movies. This activity was a big hit, which was evidenced by the audible groans of disappointment when it was time to conclude the day.

In addition to Sci or Fi? during lunch participants learned the winners of the Chemistry Poetry contest. Even chemist enjoy a departure from the sciences. Participating students were given the opportunity to submit an original poem that was in someway associated with the "Chemistry is Out of this World" theme. Students that submitted original works demonstrated great creativity in mixing science, creativity, and the written word. The entries were generally accompanied with some original artwork and were judged by staff and students in the Science Learning Center on campus. The three top poems were read by their author(s) and appear on the next page of this newsletter. Enjoy the creative prose of the winning poems.

All in all Chemistry Day 2018 appeared to be another big hit that offers a change of pace for faculty and students at CSU-Pueblo as well as for their guests.

ACS Program-in-a-Box

The Chemistry Club and Chemistry Department again served as a host for the ACS Program-in-a-Box (PIB) webinar this year. The program fit well within the National Chemistry Week them of "Chemistry is Out of this World" and was titled Voyage to Mars: Red planet chemistry. Participants joined groups from around the country in listening to a panel of experts about the chemistry of Mars, travel to Mars, and possible biochemistry to survive the trip and a stay on Mars. As in years past the PIB was held on Oct. 23rd; better known as Mole Day.

Chemistry in Poetry

Winning Poems from Chemistry Day 2018

1st Place

Debris

By: Kira Davis

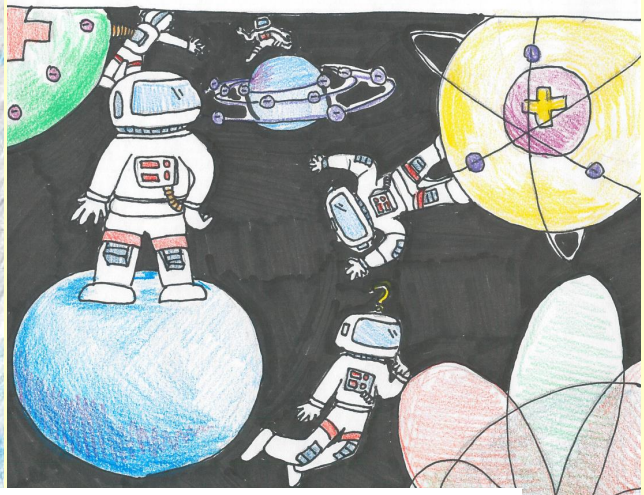
It Falls like rain in
the Starry Sky
Disintegrates upon entry like snow
when the sun hits where it lies
I wish I could be like that, drifting
until gravity makes me fly
Soaring towards the planet like a
plane with pressure of 12 psi
I crash onto earth with everything
hurt, AND a black eye
A scientist finds me, and in a
museum I stand high

3rd Place

Journey to the Center of the Atom
By Joli Dou and Justin Shure

Dalton's atom was indestructible,
Cooked into Thomson's plum pudding ball.
Rutherford's gold foil-ed it,
Bohr ran quantized rings around all.

Into outer space,
Schrodinger made quantum leaps.
The intermolecular Force was with him,
Yet he discovered no electron to keep.

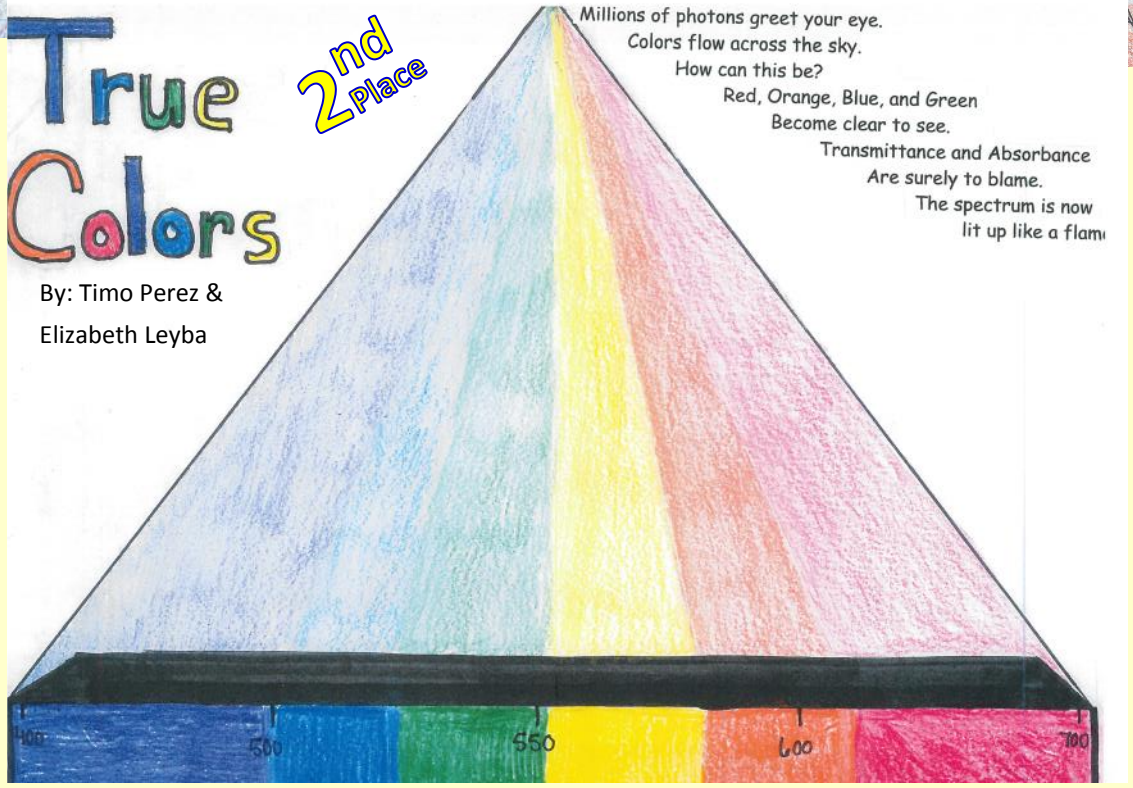


2nd Place

True Colors

By: Timo Perez &
Elizabeth Leyba

Millions of photons greet your eye.
Colors flow across the sky.
How can this be?
Red, Orange, Blue, and Green
Become clear to see.
Transmittance and Absorbance
Are surely to blame.
The spectrum is now
lit up like a flam

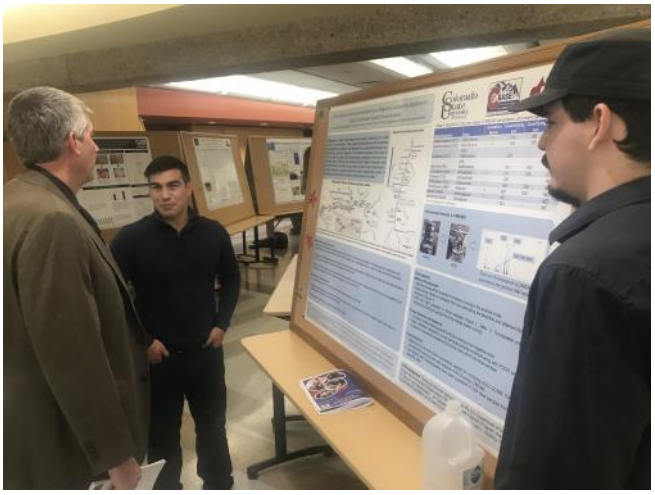


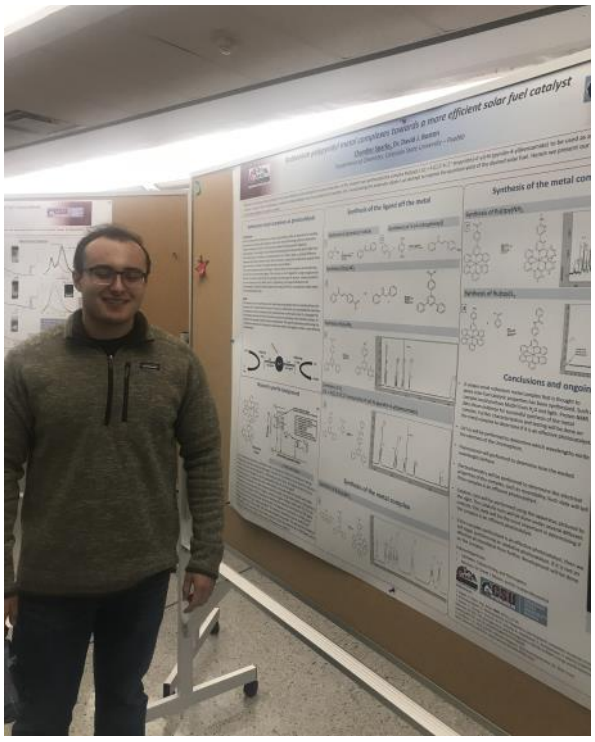
14th Annual CSM Research Symposium

The 14th Annual College of Science and Mathematics Student Research Symposium was held on Thursday Oct. 18th, 2018 in the Foyer of the Life Science Building. This is the largest CSM Research Symposium yet with over 50 research posters presented. If the Research Symposium continues to grow, a larger venue for the event will surely be required.

While student involvement in research has always been a cornerstone of CSM, the number of students participating in faculty mentored original research has grown in recent years in large part through support from the Communities to Build Active STEM Engagement (CBASE) Program. CBASE is a program funded through a Title III grant from the U.S. Department of Education.

Students working with faculty and staff in the Chemistry Department were responsible for 13 of the research presentations. These presentations represented the work of 19 students who were mentored by 8 faculty and staff in the Chemistry Department. Original research offers students the opportunity to engage in the scientific process putting the skills and knowledge gained from their coursework into practice, while learning new specialized techniques from their mentors.





How can you help support excellence in education and research within the Chemistry Department?

If you are interested in supporting the Chemistry Department with a gift for program enhancement or student scholarships please call the CSU-Pueblo Foundation office at (719) 549-2380 or visit www.csupueblo.edu/foundation/ and simply specify that your gift is to support the Chemistry Department or Chemistry Student Scholarships.

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