

CHEMICAL Compositions

Department of Chemistry Newsletter
The University of Texas at Austin

Spring 2015

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Alumni - send us your updates and news:

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Letter from the Chair

Greetings!

Our external search for a Department Chair continues, and I am happy to report that we have narrowed the list to five candidates, each of whom we feel would be an excellent leader for our department. These individuals will visit the department and present their visions for the future before the end of the semester. Hopefully by the time the fall edition of *Chemical Compositions* is released, I will have some good news.

We are also recruiting for assistant professor positions in analytical/physical and organic chemistry. We had the enviable problem of having many outstanding applicants, and it was difficult to narrow the field to the small number who were eventually invited to

campus. Of the offers we made, one appears close to accepting, and we await the decisions of two others. I will introduce you to those who will join us in the next edition of *Chemical Compositions*, but if you find you cannot stand to wait you can look for the news on our website.

Recently, UT Provost Gregory Fennes announced a program aimed at attracting the very best graduate students to selected, core departments on campus. I am thrilled that we are among those departments. The program creates a limited number of highly-competitive, five-year compensation packages that will allow us to vie for the top domestic and international students. Although this is a fantastic program that will reap benefits for the department for years, it provides only



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partial funding for outstanding students with the remainder coming from existing department graduate fellowships. See the *Focus on Giving* section for additional details.

The department is excitedly preparing for a top-to-bottom renovation of the west end of the 1929 wing of Welch Hall, which will commence in June. This long-awaited restoration and upgrade will bring new state-of-the-art research and teaching space to the department. Pending approval of funding,

(Continued on page 2)

Focus on Giving: Graduate Student Investment Initiative

The Graduate Student Investment Initiative (GSII) draws top students to UT Austin via competitive packages that cover living expenses, tuition, fringe benefits, and travel costs for five years.

Please consider a gift to our Graduate Student Fellowships, a source of funding for both GSII and our traditional academic fellowships offered to

outstanding students. Your generous support allows us to continue recruiting the best graduate students in the world.

To support GSII, please visit the [UTexas Online Giving page](#). Under the special information section, please include "Graduate Student Fellowships."

Thanks for your support.

Student and Alumni News

Safety Program Draws Students to Houston



In January, a group of staff, instructors, and graduate students traveled to Houston to participate in the new Partners in Academic Laboratory Safety (PALS) program hosted by ExxonMobil.

According to [Professor Michael Rose](#), “the ExxonMobil PALS program is a fantastic way to improve our safety culture and awareness, as well as to interconnect with a major recruiter of UT chemists. The students and staff who attended the 3-day workshop brought back some great, simple ideas. In addition to the local benefits, it's also an effective mechanism to prepare Ph.D. students for the rigorous safety environment of industry jobs in chemistry.”

The workshop included tours, presentations about the culture of safety, and best practices at ExxonMobil, and set a course for future safety initiatives at UT Austin.

Building a culture of safety mindfulness is a top goal for the Department of Chemistry and UT Austin. We're proud to announce that our [Safety Madness Competition](#) was featured in [C&EN News's Safety Zone](#) as an example of successfully motivating graduate students to think critically about lab safety.

Chair's letter, continued from page 1...

a complete renovation of the 1978 wing will follow. This will be a monumental project that will be completed in phases over the next decade. The final product will be a Welch Hall that faculty, students, and staff will be proud to call home.

In closing, it is with sadness that I report the passing of two esteemed retired department faculty. Professors Boyd Hardesty and Lester Reed died this past January. Although neither had been in the department recently, their tremendous impact on research and teaching will endure for years. See the *Faculty News* section for additional details.

Stellar Student Spotlight: Jessica Chan

Jessica is a senior and the president of the University of Texas at Austin American Chemical Society, Student Chapter.

What influenced your decision to attend the University of Texas and study chemistry?

During my senior year of high school, I was able to work in a synthetic organic laboratory working on a medicinal chemistry project. It was unlike anything I had ever done in classes or as an extracurricular activities. It allowed me to get a glimpse at what being a chemist was like, and especially how these chemists thought and how so much of what I learned in school applied to something so hands-on. I quickly fell in love with synthetic chemistry and knew that coming to UT would allow me to accomplish the things I wanted to as an undergraduate.



Describe your work with the American Chemical Society.

I have been an officer for UT's student chapter of ACS for the last 3 years and have been fortunate to work with many great peers who are passionate about chemistry and their field of study. We strive to promote as many scientific and research-based opportunities to our members and an all-around engagement in learning about fields pertaining to chemistry. We're always looking for ways to raise funds in order to sponsor as many of our members to attend the National conference each Spring. It has been eye-opening and rewarding getting to work with my friends at improving the learning environment in our college, as well as seeing UT's chapter grow in size and popularity throughout the years.

What are your plans for the future?

In the upcoming years after graduation, I plan to pursue my doctoral degree in synthetic organic chemistry, work in industry for a while, and travel a lot...in no particular order.

Faculty News

Fingerprinting Red Wine

Undergraduates in [Dr. Eric Anslyn's Freshman Research Initiative Supramolecular Sensors Stream](#) are developing peptide-based sensing arrays that differentiate red wine varietals and wine blends based on their tannin composition. Tannins are naturally occurring polyphenols found in grapes and are responsible for the astringency of wine. The sensing arrays developed by the stream mimic the nonspecific receptors in the human tongue and nose, which create patterns of signals that are specific to the food or odor encountered. Each sensing ensemble is composed of a short metal-binding peptide, a divalent metal and a dye whose optical properties vary depending on whether the dye is bound to the sensing ensemble or displaced from the ensemble. Displacement of the indicator by wine tannins produces thousands of colorimetric signals. Pattern-based

recognition statistical analysis of those signals reveals the identity of a given wine.

Fraud is a significant problem confronting the winemaking industry. The technology developed by Dr. Anslyn and his team can potentially be used for quality control and forensic applications. In fact, the stream is currently funded in part by a settlement payout from a class action suit against a wine seller for fraudulently labeled wine. The sensors can also be used to differentiate wines based on the grapes harvest time and to predict the composition of blends made by mixing two or three wine varietals. Ultimately, the goal of this research is to develop a multi-component Electronic Tongue containing a range of different sensors for wine analysis.

- Eman Ghanem, FRI Assistant Director

Inspiring Fun with Chemistry

You can find her in university lecture halls, on television, and in grade school classrooms across Central Texas. Lecturer Kate "Dr. B." Biberdorf covers a lot of ground when running Fun with Chemistry, a department program designed to inspire a love of science and discovery through hands-on activities and experiments.



Popular demonstrations include liquid nitrogen ice cream, slime production, and, of course, explosions. Engaging and undeniably entertaining, Fun with Chemistry educates young people while bolstering an interest in and love for science.

If you are interested in bringing scientific discovery to your students, you can contact Dr. B through Fun with Chemistry's [website](#).

Lester Reed and Boyd Hardesty Pass Away

The Department of Chemistry is sad to announce the passing of Professors Emeriti Lester Reed and Boyd Hardesty in January.



Lester Reed

Professor Reed joined the Department in 1948. He performed groundbreaking work on the first isolation of lipoic acid and characterization of multi-enzyme complexes, while mentoring multiple international scholars. He taught at the University until 1999 and conducted a productive research program until 2001, when he retired after 53 years. He passed away January 14, 2015 at the age of 90.

Professor Hardesty joined the Department in 1964. His best known work from the was on the development of cell free systems for the synthesis of proteins and on the biochemical mechanisms involved in their ribosomal synthesis. He retired from the university in 1999 after 35 years. He passed away January 22, 2015 at the age of 82.



Boyd Hardesty

Professors Reed and Hardesty will be missed and their contributions to science will not be forgotten.

Faculty highlights

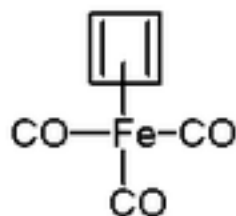
Throughout the year, our faculty are honored for their teaching and research. Since our Fall 2014 newsletter, [Richard Crooks](#) received the [Faraday Medal](#) from the Royal Society of Chemistry, [Guangbin Dong](#) was awarded a [Research Scholar Grant](#) from the American Cancer Society, and [Jonathan Sessler](#) received the [MSMLG award](#) from the Royal Society of Chemistry, and [Michael Rose](#) was named a [CNS Teaching Excellence Award Recipient](#).

Keep up with all of our achievements by visiting the [faculty news](#) and [student news](#) pages.

Department News

An Unexpected Catalyst: The Library

Early on an April morning in 1964, Lewis Watts was doing what he usually did most days: browsing newly received journal issues in the Old Mallet Library. He was a third-year graduate student in the group of Dr. Rowland “Rolly” Pettit, a young Australian chemist who had joined the faculty in 1957 and was already making a name for himself in the field of organo-iron chemistry. Watts’ mission that day had a sense of urgency. The problem of the moment, the much-sought synthesis of cyclobutadieneiron tricarbonyl, was a race among several international research groups. On this particular day, he happened across the article that would win the race for UT: a report from a Romanian group in the newest issue of *Chemische Berichte* that described the ideal dichlorocyclobutene reagent he and his



colleagues needed to create that iron complex. The flash of insight from the *Berichte* article caused him to grab his postdoc colleague, George Emerson, and they immediately set to work. Sixteen hours later they had their quarry, as confirmed by NMR early the next morning with the aid of Dr. Ben Shoulders. The

synthesis, which captured a piece of chemical history for UT, along with results from related experiments, appeared in JACS in January 1965, and was the subject of a feature article in *Chemical & Engineering News* that summer. That iron complex, more stunningly, later provided for cyclobutadiene itself – a molecule that had elude chemists

for at least sixty years.

Today, Watts credits the Mallet Library and librarian Aubrey Skinner for making this insight possible. In the days before online literature searching was even imagined, library visits were a daily routine for many chemists, and timely access to the latest issues of journals and chemical abstracts was essential. Skinner made sure all journals were quickly processed and placed in a special browsing space.



Left to right: Rowland Pettit, George Emerson, Lewis Watts, J.D. Fitzpatrick.

Now, a half-century later, browsing print journals is just a memory. But the library still provides the tools and content that scientists must have to succeed in the highly competitive research world. Look at places where cutting-edge advances are being made around the world, and you’ll always see a great library behind them. Please consider helping to maintain that greatness with a donation to the [Skinner Library Endowment](#).

- David Flaxbart, Librarian

Welch Renovation Begins Summer 2015

The renovation of the West ‘29 wing of Welch Hall will begin following the end of the Spring 2015 semester. Complementing the 2013 renovation of the East ‘29 Wing, the project will provide modern updates to research and teaching labs, offices, and meeting spaces.

Welch Hall provides space for 10,000 students daily, many in the large ‘78 wing lecture halls alumni remember fondly. Additionally, the faculty working in Welch generated \$12 million in research awards in 2013-14. Because of its importance to curriculum and research, funding for the future renovation of ‘59 and ‘78 wings is a high priority for the Board of Regents.

Take this opportunity to [share your favorite Welch memories and learn some little-known building trivia](#).



A Welch teaching lab pre-renovation



New and improved: a post-renovation lab