

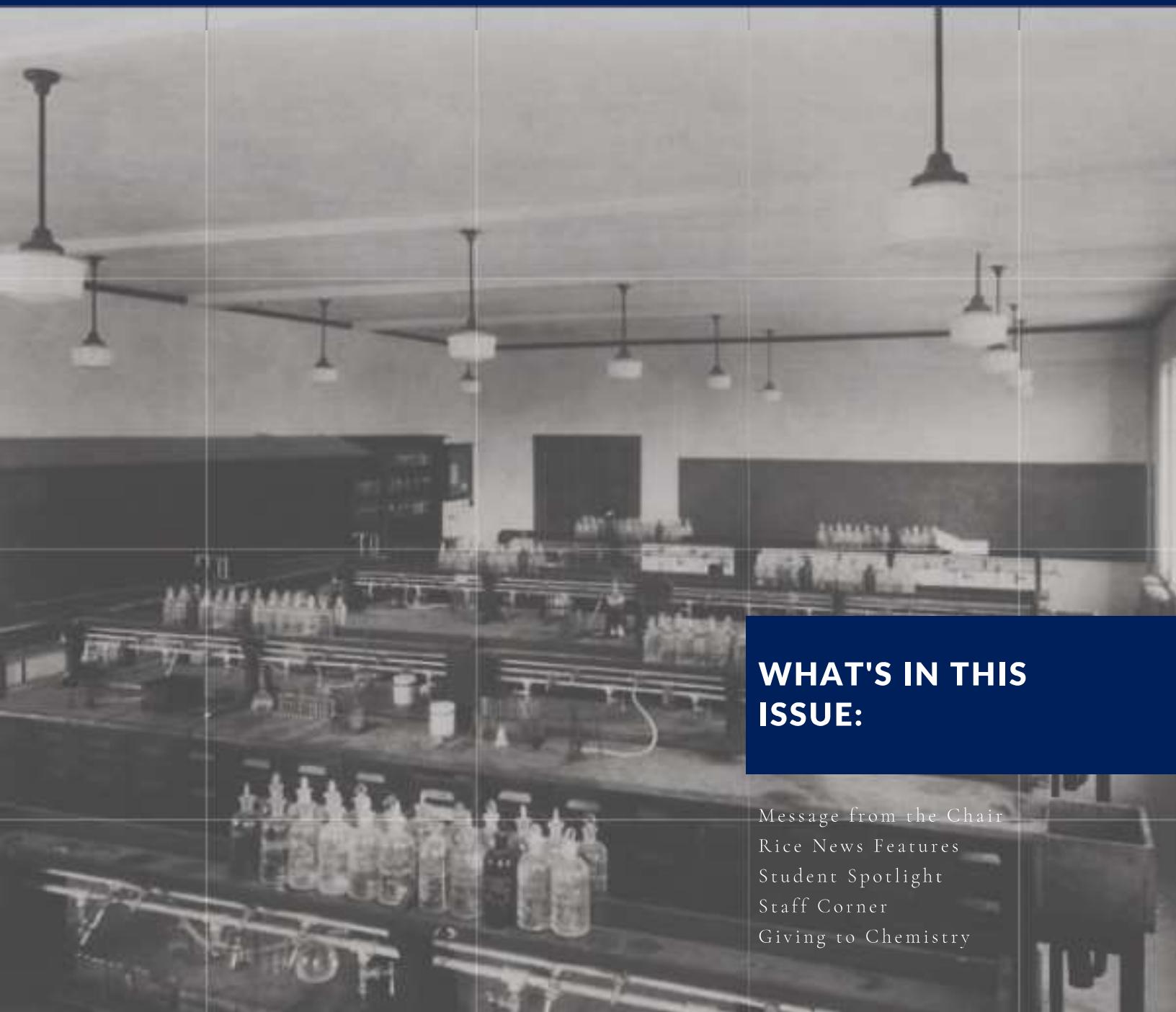


RICE NATURAL SCIENCES
Department of Chemistry

CHEM NEWSLETTER

FALL 2021

WHERE INNOVATION MEETS COLLABORATION
CHEMISTRY.RICE.EDU



WHAT'S IN THIS ISSUE:

Message from the Chair
Rice News Features
Student Spotlight
Staff Corner
Giving to Chemistry

Message from the Chair

The Department of Chemistry at Rice University continues to excel in our research and educational activities. Please enjoy our CHEM Newsletter, which appears every 6 months, highlighting some recent accomplishments and news in the Department.

We are excited to share that our research accomplishments have resulted in several research grants and awards. Notably, Gustavo Scuseria received the ACS Award in Theoretical Chemistry, the highest award for a theoretical chemist in the USA. In addition, one of our biggest achievements is a new NSF Center received by Christy Landes together with Stephan Link and Peter Rossky, a significant accomplishment in the history of Chemistry Department. Our junior faculty received several distinguished awards, recognizing their endeavors. Julian West received an NIH grant, Han Xiao received a DOE grant, Dr. Matt Jones' NSF CAREER Award was recommended for funding. Big congratulations to all of them!

We are happy to announce that we have a new lecturer, Humayun Kabir, who will join us in January of 2022. Due to expansion of the undergraduate student population at Rice, there will be more teaching activities, and we look forward to welcoming him to our department.

On a less happy side, Larry Alemany, a long-time lecturer in the department, and Pam On, Graduate Program Administrator, are retiring in early 2022. We will miss them a lot, but we wish them a happy retired life!

Our graduate students are thriving, despite the COVID unrest. Please enjoy a few write-ups by some of our graduate students, written for your enjoyment.

Our faculty, students and staff wish you a Happy New Year in 2022!

We are looking forward to have more exciting news and research accomplishments from people at the Department of Chemistry!

Anatoly Kolomeisky, Chair

Department of Chemistry

Rice News Features

Our faculty, students and researchers are doing outstanding work in the classroom and in the lab. Catch a glimpse of a few of their stories featured on Rice News this cycle.

NSF Grant Kicks off Center for Adapting Flaws into Features

There's a saying among programmers who make excuses for flaws in their code: "That's not a bug, that's a feature!" Chemists at Rice University are taking the concept far more seriously. A multiuniversity team led by Rice chemist Christy Landes has landed a National Science Foundation grant to establish the NSF Phase I Center for Adapting Flaws into Features (CAFF). Its goal is to exploit chemical defects that show the potential for unique reactivity to optimize the structural and electronic properties of materials. The award is a three-year Phase I grant for \$1.8 million through NSF's Centers for Chemical Innovation Program. It will allow Landes and her team to make their case for a longer-term Phase II award to explore "high-risk" ideas and new approaches toward transformative technologies. The team includes Rice chemists Stephan Link and Peter Rossky, along with scientists from Stanford University, the University of Illinois at Urbana-Champaign, Stony Brook University, the University of Texas at Austin and the University of Wisconsin. Full Article: news.rice.edu/news/2021/nsf-grant-kicks-center-adapting-flaws-features



Nicolaou Wins Robert Koch Gold Medal

K.C. Nicolaou, the Harry C. and Olga K. Wiess Professor of Chemistry, has been awarded the Robert Koch Gold Medal for his life's work in biomedical science. The annual prize is awarded by the Robert Koch Foundation, founded in 1907 in Berlin to promote basic scientific research into infectious disease as well as exemplary projects to solve medical and hygienic problems. An award ceremony will take place at the Berlin-Brandenburg Academy of Sciences on Nov. 19 at 9:30 a.m. Central time, and will be streamed on LinkedIn. Nicolaou, who joined Rice in 2013, specializes in the total synthesis of natural substances that can help treat disease but are not found in sufficient quantities to be useful. His labs at Rice and, earlier, at the Scripps Institute; the University of California, San Diego; and the University of Pennsylvania have developed chemical synthesis routes for hundreds of natural products, making them available for widespread use. Full Article: news.rice.edu/news/2021/nicolaou-wins-robert-koch-gold-medal



Corps of Engineers funds bid to ‘flash’ waste into useful materials

Where others see a pile of trash, Rice University chemist James Tour sees a figurative gold mine. The U.S. Army Corps of Engineers agrees, and it will work with Tour and his collaborators through a \$5.2 million, four-year grant to reclaim valuable materials from waste through flash Joule heating.

Among the initiatives is a strategy to recover cobalt, lithium and other elements through the process developed by Tour’s group several years ago to turn waste into graphene.

The grant through a Department of the Interior Cooperative Research and Development Agreement will allow the Rice-based team to extend the impact of its discovery last year that “flashing” food waste and other trash with a high-voltage jolt of electricity turns it into graphene.

Through further experiments, the team realized the process could do much more. “We’re pushing the idea that flash Joule heating can go way beyond just graphene,” Tour said.

The Rice researchers plan to work on the recovery of precious metals from electronic waste, rare earth elements from fly ash (burned coal), toxic metals from contaminated soil and high-surface-area graphene for use in controlling algae blooms.

The work will incorporate molecular models by Rice materials theorist Boris Yakobson and former postdoctoral researcher Yufeng Zhao, now an assistant professor at Corban University in Salem, Oregon, to provide solid theoretical footing for new discoveries. Jian Lin, also a former Rice postdoctoral researcher and now an associate professor at the University of Missouri, will write machine-learning code to streamline the flash process.

Full Article: news.rice.edu/news/2021/corps-engineers-funds-bid-flash-waste-useful-materials

American Chemical Society Honors Gustavo Scuseria

Gustavo Scuseria, the Robert A. Welch Professor of Chemistry and a professor of physics and astronomy and of materials science and nanoengineering at Rice University, is the winner of the 2022 American Chemical Society (ACS) Award in Theoretical Chemistry. Scuseria was honored “for his contributions in the areas of coupled cluster and density functional theories, and linear scaling electronic structure algorithms,” according to the society.

“There are several national ACS awards that are the most prestigious, but this is the only one for theory,” Scuseria said. “That makes it special for me.”

The award honors achievements by Scuseria, who joined Rice in 1989, that straddle quantum chemistry, condensed matter physics and materials science with an eye toward energy and environmental applications.

Full Article: news.rice.edu/news/2021/american-chemical-society-honors-gustavo-scuseria



Rice Profs Among Historic Greek Heroes

A couple of Rice University professors are among 63 Greek physicians and biomedical researchers from the past 200 years honored as part of the nation's bicentennial.

K.C. Nicolaou, the Harry C. and Olga K. Wiess Professor of Chemistry, and Antonios Mikos, the Louis Calder Professor of Bioengineering and of Chemical and Biomolecular Engineering, are among scientists chosen as part of the nation's 1821-2021 Initiative celebration.

Full article: news.rice.edu/news/2021/rice-profs-among-historic-greek-heroes



Birthday Symposium Honors Peter Rossky

Peter Rossky, the Harry C. and Olga K. Wiess Professor of Chemistry, a professor of chemical and biomolecular engineering and former dean of the Wiess School of Natural Sciences, was the man of the hour at a symposium held Dec. 6-7 at Rice in belated honor of his 70th birthday in April. The event at the BioScience Research Collaborative, organized and hosted by the Department of Chemistry, presented lectures by Rossky's former mentees, collaborators and closest scientific friends. It was sponsored by the Wiess School of Natural Sciences, the Office of Research and the departments of physics and astronomy and of chemistry.

Article: news.rice.edu/news/2021/symposium-honors-rossky



Promotions

Laszlo Kurti,
Promoted to Professor (July 2021)

Retirements

Larry Alemany
Pam On

THE DEPARTMENT IS GRATEFUL FOR LARRY'S YEARS OF SERVICE AS NMR MANAGER. WE ARE ALSO GRATEFUL FOR PAM'S YEARS OF SERVICE, HER CONTRIBUTIONS ARE NUMEROUS. BOTH WILL BE MISSED.

Student Spotlight

WHY I RUN

By: Theodor Gerrard-Anderson



It's early morning on October 2nd and the St. George half-marathon is underway. I've been running for eight miles under a starry sky, and the sun is just starting to rise over the red rock hills of southern Utah. The beauty of the landscape is striking, and I briefly forget the pain I'm in. I can see St. George at the bottom of the valley. The finish line is within reach. As I enter the steepest downhill section of the race I don't hold back. My heart is a combustion engine, my limbs are pistons pumping back and forth perfectly in sync. As I hurtle down the track – breaking my fastest mile time ever – I seem to be flying. I feel alive – and my PhD and lab work are, for a time, totally banished from my thoughts.

If you're anything like me, this moment of freedom is rare. During a PhD, it's easy to become completely consumed by work, to the point that it completely dominates our lives. Our emotional barometer rises and falls with the success or failure of an experimental result or our advisors' opinion on our progress. We risk losing touch with the outside world. Our labs, and the Rice bubble, become our entire universe. When we lose perspective, small issues loom disproportionately large. It is vital for us to find other goals, unrelated to our studies, to challenge us.

For me, running is the perfect remedy. Spending time outdoors in the fresh air grounds you. The primal simplicity of running, which our bodies are well designed to do, contrasts sharply with the complexities of modern life. It's a return to nature. Running can also be deeply meditative. Your mind is so focused on the task at hand that you don't have space for obsessive thoughts. Thoughts come and go as they please. Naturally it's also fantastic for your physical health. Running is tough, but the challenge is part of the appeal. Running also brings quantitative and achievable goals which research can be slow to deliver, such as improving your pace, increasing your weekly mileage, breaking personal records. The payoff in personal purpose and self-esteem is great.

This is why I decided to sign up for a half-marathon. I trained for 30-40 miles per week. Some days, heading out for a run was the last thing I wanted to do, but the discipline paid off. I was able to run those 13.1 miles in 1 hour, 26 minutes, and 46 seconds. The whole experience was exhilarating. The shared anticipation with all the other runners at the starting line, the cheers from spectators, the sense of fellowship with the strangers running alongside me. Finally crossing that finish line was one of the proudest moments of my life and a memory which will stick with me forever. The feeling was euphoric, and I fear somewhat addictive. It may not be long before I find myself signing up for another!

2021-2022 Arthur L. Draper Award

In recognition of exceptional performance in undergraduate chemistry coursework

Pearl Fernandes

Hallie Trial

Nikhil Gattu

Michael Nevins

Alex Berlaga

Robert Carter

Maia Helterbrand

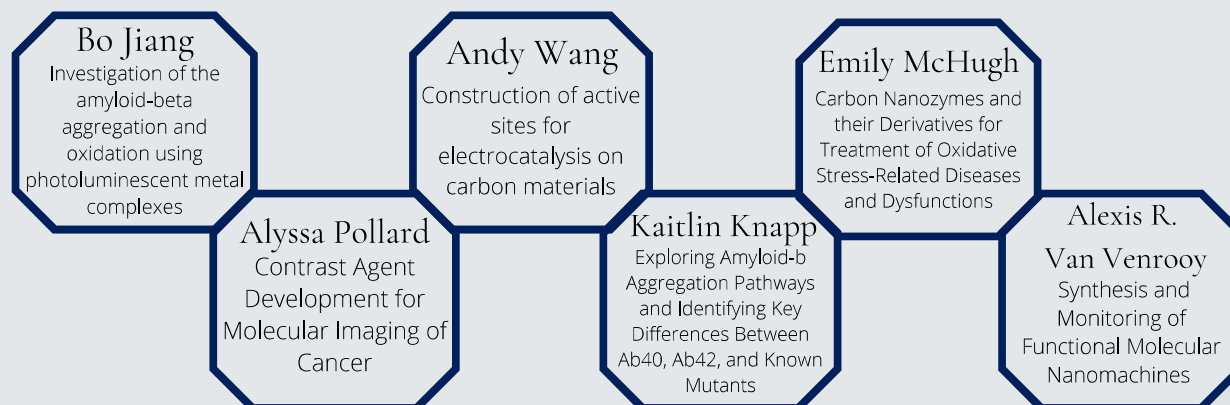
Sohyun "Alexandra" Lim

Houston Livestock Show & Rodeo Fellowship

In recognition of Rice graduate students who have demonstrated outstanding potential for the completion of a graduate degree program in biology or a related biological science.

Emil Gillett

December 2021 Graduates



Chemistry DEI Bookclub

By: Vanessa Espinoza

The CGSA sponsored Diversity, Equity, and Inclusivity (DEI) book club is a new discussion group that has been meeting bi-weekly since Spring 2021. This book club is open to all members of the chemistry department, and we are excited about the continual participation we have had from Chemistry undergraduate students, graduate students, faculty and staff. This is another DEI-focused initiative that has been added to the department in an effort to further educate ourselves about the inequities that have been perpetuated, not only through academia, but our community at large. This insight is crucial to learning what steps we can take to provide a safer and more inclusive community within our Chemistry family. We have had the chance to tackle some difficult, but important reads that include *How to Be an Anti-Racist*, *The Privileged Poor* and *The Color of Law*. While each book is quite different, they each provide a structured opportunity to learn from authors who have done substantial work to learn about significant problems that have been barriers to a more equitable world. During our meetings, we use our time to reflect on the latest chapters we have read and also work to develop ideas about what changes can be implemented at the departmental level to promote the success of all members of our community. While these chapters are difficult to read, we believe that it is crucial that we take a serious look at how disparities between communities perpetuate through society. These discussions are also a constant reminder that we need to be mindful of this as we interact with our peers and colleagues and constantly work to lead anti-racist lives.

STAFF CORNER

Greetings from the Department of Chemistry Administrative Staff. The team is thriving, despite the continual changes due to the pandemic and our newly implemented ERP system, Oracle Cloud—titled imagineOne (iO). The last year has been extremely difficult, but we continue to strive to provide better services to our faculty, students and staff. Our goal is to support the mission of our department to further research, by managing all the administrative functions as effectively and efficiently as possible. We are sad to announce that our Graduate Program Administrator, Pam On, will retire in January of 2022. We will miss her tremendously, but wish her the best in the new chapter of her life. We are pleased to welcome our two newest staff members—Stacie Millas (Events Coordinator, who produced this amazing Newsletter) and Tammy Martin (Department Coordinator). We wish all a happy and prosperous New Year 2022!



RICE NATURAL SCIENCES
Department of Chemistry

GIVING TO CHEMISTRY

The global impact of Rice University is expanded and sustained by the accomplishments and support of our alumni and friends. The continued generosity of our donors is paramount to the mission and goals of Rice Chemistry. Graduate student education and research are top priorities in the Department of Chemistry. Graduate fellowships attract and sustain a strong body of doctoral students, an important component of our research programs and accomplishments. Endowment(s) for graduate student fellowships provide an opportunity to complement and improve our chemistry graduate program, thereby contributing to educating and training the next generation of scientists to improve our healthcare, protect our environment, develop new and clean energy sources, and create the novel materials of the future—for all intents and purposes, for a better world.

Giving to our Chemistry means supporting our academic efforts. Gifts to the General Support Fund have significant student impact by providing student stipends or other education needs of our students. Additional awards and endowed funds in the Chemistry department are also established to support various aspects of teaching, learning, and research. To learn more about our funds, please visit our website: <https://chemistry.rice.edu/give-chemistry> Your gift will tremendously help our research program in advancing science and in training new generations of educated specialists. If you would like to know more about how you can support the Department of Chemistry please contact the Wiess School of Natural Sciences Director of Development Jackie Macha at jackie.macha@rice.edu or 713-348-4268. We are grateful for your support. Thank you!

The Department of Chemistry thanks you very much for your continued support!

riceconnect.rice.edu/donation/support-chemistry

Department of Chemistry

6100 Main Street

Houston, TX 77005

Phone: 713-348-4082

Fax: 713-348-5155

Email: chemhelp@rice.edu

Website: chemistry.rice.edu

WE WANT TO HEAR FROM YOU!

Let us know what you've been up to since leaving Rice by filling out our alumni form:

bit.ly/2Mezkwb