

# KSU CHEMIST



Department of Chemistry  
Kansas State University  
213 CBC Building  
Manhattan, KS 66506

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Reach out to us at:

Web: [www.ksu.edu/chem](http://www.ksu.edu/chem)

Phone: 785-532-6665

E-Mail: [chemdept@ksu.edu](mailto:chemdept@ksu.edu)

Twitter: @KStateChemistry

## From the Department Head

Dear Friends:

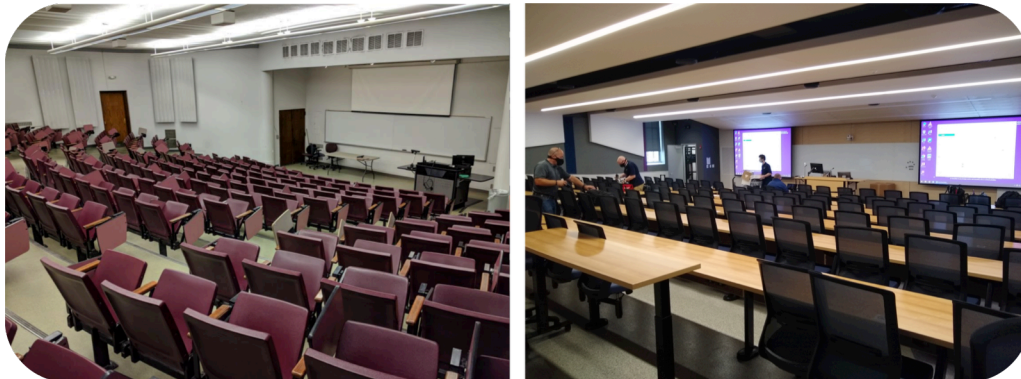
Well, I'm very glad the 2020-2021 school year is over! And that it looks like the COVID-19 pandemic is subsiding in the U.S. Let's all hope we are really done with this! I had wanted to write about something different here, but the pandemic so dominated most of our lives this past year, I don't believe I can avoid it. First, let me start with the good news in all of this. We made it through without any evidence of the virus spreading in any of our classrooms or labs! I firmly believe this is a result of the measures we took to prevent its spread. All large enrollment courses (50 students or more) were taught remotely this past year. Smaller courses that were taught in person were moved to larger rooms so the students could socially distance. Many of these smaller courses were also taught remotely or in a hybrid fashion to better keep people separated from each other. Our labs mostly operated in a hybrid mode, with student time in the labs reduced by rearranging lab procedures or by having students perform only half of the usual lab experiments, while completing the other half as

remote "dry-labs". In the latter, videos and data from the labs were provided to the students electronically. Overall, things went extremely well under the circumstances, but it was hard on everyone. Perhaps the biggest factor was that we are all fundamentally social beings, so interacting via remote meeting platforms like Zoom, or teaching a class or holding a research group meeting while wearing a mask are highly unsatisfactory. It's so easy to get distracted while watching things on a computer screen. And wearing a mask blocks most forms of facial expression that are so critical to nonverbal communication. It's often hard to understand words spoken through a mask, too. Just this week our mask mandate was lifted and it feels great to be back to interacting more normally with our students. I hope you all made it through the year with little more than some of the same (or similar) annoyances. Above all, stay healthy, and best wishes for a better 2021-2022!

*Dan*

## Renovation of Willard 114

Many of you likely remember having class in Willard 114. Many may remember its appearance from the photo at the left, below, while others may remember an even earlier version of this classroom, with a blackboard and a long bench for performing chemistry demonstrations at the front, and wooden seats for the students. Well... the room has undergone a complete renovation and now appears as shown in the photo at the far right. Instead of individual fold-out desks, students sit at long tables that extend along each seating terrace. Instead of a whiteboard at the front that was inconveniently covered up by a single large projection screen that could be



lowered from the ceiling, there are two smaller screens, one on each side of a central board. The room is also equipped with modern lecture technologies and has better lighting. Recent problems with room ventilation and temperature have been corrected, giving our students a comfortable and state-of-the-art classroom experience. The prep rooms on both sides up front were also removed. A previous renovation did away with the unique metal spiral staircases to the basement below. An additional loss was a reduction in room capacity. The room used to seat about 230 students, but now seats only 166. Unfortunately, this means most of our freshman chemistry courses will need to be taught elsewhere as each section regularly exceeds 200 students. Nevertheless, Willard 114 now has a distinctly different feel to it than it did before, and I know our students appreciate the upgrades!

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## Word from the Glass Shop

A research-oriented scientific glassblowing shop is often asked to fabricate interesting apparatus. And these can be far from what might usually come to mind. Certainly a blood feeder for mosquitoes – aka, a “mosquito feeder” – fits this description. A photo of one of these is shown below. Researchers on our campus and in our community are studying



insects that carry blood born pathogens. These can potentially infect humans and livestock. To study these pathogens and their transmission mechanisms, a population of mosquitoes must be raised in the laboratory and kept alive during the research.

Since most blood feeding insects only like blood at or near body temperature, the mosquito feeder has a water jacket to maintain the blood in the inner chamber at the correct temperature. A membrane to mimic skin, often made from parafilm or collagen, is stretched over the bottom of the inner chamber. The insect feeds by penetrating the membrane with its proboscis. The feeders can either be suspended in the insect enclosure or rest upon a mesh covering large enough for the proboscis to pass through, but too small for the body of the insect.

There are many shapes and sizes of the basic design depending on the needs of the insect and the demands of the research. Feeders from the glass shop are currently being used in malaria studies in the Division of Biology at K-State, as well as in USDA laboratories and in the new National Bio and Agro-Defense Facility (NBAF) located in Manhattan, KS.

*James Robert Hodyson*

## Undergraduate Scholarships Awarded for 2021-2022

**Jackson Adams**, Wichita: the Jack and Betsy Lambert Scholarship

**Benjamin Biggs**, Manhattan: the Jack and Betsy Lambert Scholarship and the Herbert C. Moser Scholarship

**Nicholas Bougher**, Olathe: the Jerry and Judy Reed Scholarship and the Raymond A. Voet Scholarship

**Jennifer Breiling**, Manhattan: the Future Chemists Scholarship

**Austin Burenheide**, Lecompton: the Jack and Betsy Lambert Scholarship

**Valeria Collazo**, Salina: the Travis W. Miller Memorial Scholarship

**Mason Cook**, Abilene: the Georganne Fowler Hiser Chemistry Scholarship

**Amanda Currie**, Garden City: the Jack and Betsy Lambert Scholarship

**Tyler Davis**, Wakarusa: The Dow – KSU Alumni Scholarship and the Jack and Betsy Lambert Scholarship

**Taylor Davison**, Salina: the Jerry P. and Geraldine L. Hefling Scholarship

**Maya Daily**, Salina: the Jack and Betsy Lambert Scholarships

**Christopher Dean**, Wheelerburg, OH: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship

**Jane Eilers**, St. Charles, MO: the George and Linda Hawks Scholarship Award in Chemistry

**Maeci Exline**, Salina: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship

**Madysen Farr**, Wamego: the ACS Hach Land Grant Scholarship

**Glenne Hinkle**, Kansas City, MO: the Jack and Betsy Lambert Scholarship

**Daniel Hubin**, Weatherford, OK: the Chemistry Undergraduate Academic Scholarship and the Baldwin Reinhold Jr Undergraduate Scholarship

**Samantha Jenkins**, Olathe: the Dr. Duane L. and Virginia Eddy Barney Scholarship and the H. H. King Memorial Scholarship

**Caleb Kline**, Salina: the Nancy Mundwiler-Peters and Bruce Peters Chemistry Scholarship and the Jerry and Judy Reed Scholarship

**Karrin Larson**, Clay Center: the Manzo-Lathrop Chemistry Scholarship and the Jack and Betsy Lambert Scholarship

**Trae Megaffin**, Hays: the Richard J. Van Winkle Memorial Scholarship

**Anthony Nistico**, Manhattan: the Future Chemist Scholarship

**Rachel Pang**, Overland Park: the Isobel and Dale Smith Chemistry Scholarship

**Broderic Rathbone**, Hillsboro: the ACS Hach Land Grant Scholarship

**Marrissa Raynesford**, Hays: the Jack and Betsy Lambert Scholarship

**Cooper Lee Ryan**, Gooddard: the H. H. King Memorial Scholarship

**Chahat Sehgal**, Nevada, MO: the M. Dale and Janet Hawley Scholarship, the Joseph V. Paukstelis Memorial Scholarship, and the Null Family Scholarship

**Emma Spartz**, Ellington, CT: the James A. Branson Memorial Scholarship

**Brandon Stedry**, Ballston Spa, NY: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship

**Jacob Suiter**, Macksville: the Philip A. Van Winkle Memorial Scholarship, the Douglas L. Nelson Chemistry Scholarship, and the Jack and Betsy Lambert Scholarship

**Morgen Sumler**, Lees Summit, MO: the Jack and Betsy Lambert Scholarship

**Brooke Vogt**, Manhattan: the Eugene E. Howe Scholarship

## A Note of Thanks

Our department presently awards 28 distinct, named scholarships to our undergraduates. The total amount awarded for the 2021-2022 academic year is over \$120,000. This valuable financial assistance helps to reduce the amount of time our students must spend working outside of school to meet their expenses, and allows them to concentrate more on their studies. In other cases, it helps them avoid borrowing large sums for their education, allowing them to more quickly reach financial security after graduation. This assistance often allows them to enroll in additional courses that they could not otherwise afford, broadening their knowledge, better preparing them for diverse careers, or simply helping them become more well rounded people. Our students are all very honored to receive these awards and are profoundly grateful to all those who have given so generously to these scholarships. From all of our students and faculty, *thank you* for all you have done to facilitate learning at Kansas State University!

## Giving to the Chemistry Department

A big **THANK YOU** to all who have given to Chemistry this past year!

Total giving to the Department of Chemistry from June 1, 2020 to May 31, 2021 is shown below. We are grateful to all our faithful alumni and friends for their continued support!

**Undergraduate Student Scholarships: \$89,575**

Undergraduate scholarships are awarded directly to our individual students majoring in Chemistry. The funds are commonly used by the students to pay tuition, room and board expenses, and to purchase textbooks.

**Graduate Student Fellowships: \$17,777**

Graduate student fellowships help pay student stipends so that they may concentrate on their research projects.

**General Departmental Support: \$108,151**

General departmental support is critical to the operation of our department, and is used to pay for seminar speakers, faculty and student travel to conferences, startup funds for new faculty, and matching funds for large equipment grants.

**Endowed Excellence Funds: \$6,164**

These funds are used to help enhance our educational and research programs. They may be used to help recruit and retain diverse students, faculty, and staff. They are also used to help us develop unique new research and teaching programs.

## Highlights from 2020-2021

### A New Single Crystal X-ray Diffractometer

The winter holidays arrived this last year with a new instrument being delivered to our department: a Rigaku single crystal X-ray diffractometer. Single crystal X-ray data are critical to most research projects in synthetic chemistry. Being able to obtain a crystal structure for a new compound is important to confirming its molecular structure and also to understanding its physical properties such as how it forms crystals when precipitated from solution. The exact form of the crystal obtained can impact its solubility, for example, and this is in turn important in the development of new pharmaceuticals and agrochemicals. University Distinguished Professor Christer Aakerøy served as the lead investigator on a proposal to the US National Science Foundation in early 2020 to obtain funding to support the purchase of just such an instrument. Thanks to Christer's leadership, and the contributions of several other faculty members, the proposal passed the rigorous peer review process with flying colors and was awarded to our department in late 2020. The instrument is now providing crystal structures on many new compounds being developed in our department. We are grateful to the many donors who helped us cover the matching funds required by the NSF.



### A New Student Group for Chemistry and Chemical Engineering

Thanks to the efforts of one of our faculty, Assistant Professor Tendai Gadzikwa, we now have a new student organization affiliated with both our department and the Department of Chemical Engineering. Tendai has established the first chapter of NOBCCChE, the National Organization of Black Chemists and Chemical Engineers, in the State of Kansas! The stated purposes of our chapter are to spread knowledge and understanding of Chemistry and Chemical Engineering via public engagement with a goal of increasing the participation of underrepresented minorities in the chemical sciences; to provide a platform for student members to develop scientific, professional, and leadership skills; to cultivate professional networks; and to foster an all-inclusive community at Kansas State University. Our NOBCCChE chapter provides individuals with peer or faculty mentoring and hosts scientific talks, workshops on the development of academic skills, and the occasional game night, just for fun!



# Transitions in the Chemistry Department

## Departures

Sadly, a few of our colleagues have either recently left K-State for other locales or have decided it was time to retire. University Distinguished Professor Stefan Bossmann departed during summer 2020 and moved to the University of Kansas Medical Center to continue his research on nanobiosensor approaches to early diagnosis of cancer and other diseases. He will continue several collaborations with our faculty, so we expect to see him on campus regularly! He was a popular instructor of both our on-campus and Global Campus organic chemistry courses over his many years on our faculty. University Distinguished Professor Ryszard Jankowiak transitioned into retirement at the end of the spring 2021 semester. He plans to continue to do (mostly) computational research on the photophysics of photosynthesis during his retirement, and will still be around the department on a regular basis. We wish him all the best during this momentous transition! Assistant Professor Santosh Aryal departed K-State at the end of the spring 2021 semester to take a position in the Department of Pharmaceutical Sciences and Health Outcomes at the University of Texas -Tyler. It was a pleasure to have him on our faculty and we will miss his positive attitude and infectious enthusiasm for research. Dr. Kanika Sharma, a member of our teaching faculty, and Dr. Abhi Sinha, a member of our teaching faculty and also our departmental X-ray Crystallographer both departed for Oregon during the previous year. Kanika was a popular instructor in our freshman chemistry program, and Abhi ran our undergraduate labs in organic chemistry. Most recently, Associate Professor Mark Hollingsworth announced his plans to retire just prior to the start of the fall 2021 semester. Mark had taught nearly every graduate and undergraduate course in organic chemistry since his arrival here in 1998, and conducted research in the area of physical organic chemistry, exploring the intricate arrangements of molecules in, for example, urea crystal inclusion compounds. As Stefan Bossmann, Santosh Aryal, and Mark Hollingsworth were all members of our Organic Group, you can imagine we have significant hiring needs in this area! See below for an announcement on one new arrival.

## Dr. Socrates Munoz

### A New Arrival

We are thrilled that Dr. Socrates Munoz will be joining our faculty in fall 2021 as a new Assistant Professor in the Organic Group. Socrates received his B.S. in Pharmaceutical Chemistry and Biology from the University of Guadalajara in 2010. He then completed his Ph. D. at the University of Southern California (USC) in 2015, working under the direction of Profs. Surya Prakash and George Olah. After an initial postdoctoral appointment also at USC, he received an NIH Postdoctoral Fellowship, which he completed at the California Institute of Technology, working under the direction of Prof. Greg Fu. His research interests lie at the intersection of synthetic organic chemistry, organometallic chemistry, and catalysis, all directed towards development of new synthetic methods and small molecules with applications in medicinal chemistry.

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## Recent Graduates

### Bachelor of Science

Marcel Chlupsa  
Hawa Dembele  
Douglas Farleigh  
Fayth Aundrea Lopez  
Nathan Marshall  
Kylee Trout  
Jestin Gage Wright

### Graduate Degrees

#### **Amila Abeysekera**

Major Prof: Christer Aakeröy  
Title: From Intermolecular Forces, via Crystal Engineering, to Mechanical Flexibility in the Organic Solid State.

#### **Prathibha Kaushaki Desman**

Major Prof: Ryan Rafferty  
Title: Balgacyclamides: Efforts Towards Total Synthesis and Applications into Solving Complex Biological Problems.

#### **Ayyappan Elangovan, Ph.D.**

Major Prof: Jun Li  
Title: Novel Three-Dimensional Nanostructured Carbon Materials as Electrocatalyst Support in Low-Temperature Fuel Cells.

#### **Ramesh Marasini, Ph.D.**

Major Prof: Santosh Aryal  
Title: Design Strategies and Application of Stimuli-Responsive Nanoparticles for Cancer Diagnosis and Therapy.

#### **Sagar Rayamajhi, Ph. D.**

Major Prof: Santosh Aryal  
Title: Engineering Synthetic and Natural Vesicular Systems for Time-Targeted Drug Delivery.

#### **Jay Ronald Sibbitts, Ph.D.**

Major Prof: Christopher Culbertson  
Title: Advancing Microfluidic Single-Cell Analysis Technologies, Techniques, and Applications for the Study of Cancers and Neuroinflammatory Diseases.

#### **Yang Song, Ph.D.**

Major Prof: Jun Li  
Title: Development of Electrode Array Based Biosensors for Detecting the Activity of Cancer Related Proteases.

## Recognition and Awards

Faculty and Staff	Graduate Students
<p><b>Tobe Eggers:</b> PLU Chemistry Department Distinguished Service Award, 2020</p> <p><b>Paul Smith:</b> Recipient of his second \$1 million Keck Foundation Award</p> <p><b>Stefan H. Bossmann:</b> Named University Distinguished Professor Emeritus, 2021</p> <p><b>Ryszard Jankowiak:</b> Named University Distinguished Professor Emeritus, 2021</p> <p><b>Takashi Ito:</b> Awarded sabbatical leave for the 2021-2022 academic year.</p>	<p><b>Kanchana Samarakoon (Gadzikwa):</b> PLU Award</p> <p><b>Amila Abeysekera (Aakeröy) and Kayla Eschliman (Bossmann):</b> Graduate Research Award</p> <p><b>Gowri Kuda-Singappulige (Aikens):</b> Mitsugi Ohno Award</p> <p><b>Abigail Kreznor (Culbertson):</b> Meloan Award in Analytical Chemistry</p> <p><b>Jordan Gipper (P. Li), Sabari Rajendran (J. Li), Sachithra Somachandra (Sues), Wei Wu (P. Li), Ying Zhang (P. Li):</b> PLU Graduate Classroom Performance Award</p> <p><b>Kelly Shunje (Aakeröy):</b> 1<sup>st</sup> Place Presentation, 2021 Capitol Graduate Research Summit</p> <p><b>Olivia Hull (Aikens):</b> Department of Energy Computational Science Graduate Fellowship</p> <p><b>Basanta Archarya:</b> Fateley-Hammaker Collaboration Award</p> <p><b>Arnaldo Torres-Hernandez (Rafferty):</b> John Berschied and Donna Derstadt Fellowship</p> <p><b>Logan Trowbridge (Sues):</b> John Berschied and Donna Derstadt Fellowship</p> <p><b>Anthony Fatino (Rafferty):</b> Jerry and Judy Reed Fellowship</p> <p><b>Macy Payne (Bossmann):</b> Noticxe Fellowship</p>
Undergraduate Students	
<p><b>Gage Wright (J. Li):</b> PLU Research Award</p> <p><b>Gage Wright and Nathan Marshall:</b> Senior PLU Classroom Performance Award</p> <p><b>Anthony Nistico:</b> Junior PLU Classroom Performance Award</p> <p><b>Karrin Larson and Rachel Pang:</b> Sophomore PLU Classroom Performance Award</p> <p><b>Ben Biggs and Jane Eilers:</b> Freshman PLU Classroom Performance Award</p>	
<p>Cover photo: Arts and Sciences Commencement – Spring 2021. Photo credit: Dan Higgins.</p>	