

KSU CHEMIST



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

VOL. 17, SUMMER 2022

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From the Department Head

Dear Friends:

The spring 2022 semester is now over, the summer is just beginning, and there is lots of excitement among our faculty and students for the extra time summer provides to concentrate on research, while also getting in a little rest before the start of another academic year. I have a few pieces of news to share, and will start with a bit of sad news. On June 10, 2021, just after last year's KSU Chemist was sent for printing, Dr. Cliff Meloan passed away. Cliff was on the Chemistry faculty from 1959 until his retirement in 1996. During his time here, he guided 50 Ph.D. students and 26 M.S. students through to their degrees and taught multiple courses in analytical chemistry. His presence in our midst will be greatly missed! Within the department itself, we have good news to report on the renovation of our fume hood system in the Chemistry Biochemistry Building. After struggling to keep the hoods functional for many years, we were able to begin an approximately \$2 million project that involves replacing most of the electronic controls, valves, exhaust fans and air intake fans in the building. The project is now largely

complete with work on only about 20 of the 145 hoods remaining to be done. The new system will ensure the functionality of these critical safety devices for many years to come and should also save the university a fair amount on utility bills! As further good news, I share that we now have a new 4+1 BS Chemistry – Masters of Business Administration degree program working its way through the approval process. This new degree program will be offered for the first time starting in Fall 2023 and is expected to be popular among students wishing to pursue a career in industry after graduation. Finally, I note that this will be my last letter to you as Department Head, as I have decided to return to a regular faculty position after almost six years in this position. I am most looking forward to having more time to concentrate on my teaching and research once again! A letter from our new Head, University Distinguished Professor Christer Aakeröy is included in this issue. We will be in great hands under his leadership!

Dan

From Christer Aakeröy – our new Department Head

Dear Friends:

As the realization begins to sink in that I will be the next head of the Department of Chemistry at K-State, I can't help but wonder how I got to this point. From humble beginnings in Sweden, born to immigrant Norwegian parents, the first person to go to college in my family, it has been quite a journey, and I am truly grateful and excited to be given this opportunity to work with past, present, and future members of our department.

First, I would like to express my sincere gratitude to Professor Dan Higgins who has guided us through what has arguably been the most difficult five-year period in the history of the department. Dan has faced crippling budget cuts, staff shortage, decreasing enrollment, as well as a global pandemic that changed the world for all of us. However, Dan has managed to keep us on course (and mostly sane!), through his incredible work ethic, thoughtful decisions, creative problem solving, and steely resolve. Throughout his tenure he has been unfailingly reliable, optimistic, supportive, and a true role model. So, in short, thank you, Dan! I do wish we could recognize you in a way that is commensurate with your efforts and contributions (maybe an Endowed Chair, or how about 'Higgins Hall'....anyone?).

So, what happens next?

My first task will be a fact-finding mission through the department's finances, budget woes, infrastructure problems, and staffing-teaching challenges. Fortunately, we have outstanding people in this department, and their creativity, passion, and dedication will guarantee that we continue to offer excellent educational experiences for our students, as well as a world-class research enterprise. Many challenges lie ahead, and I firmly believe that together we can turn problems into opportunities, but there are several key areas that need to be addressed over the next few years.

We are currently at our lowest number of research active faculty members since I arrived at K-State, and it is imperative that we replace and rehire in order to maintain the critical mass necessary for a vibrant and viable Ph.D...

Continued on p. 4: New Department Head

Word from the Glass Shop

Designing unique glass apparatus for research is challenging and rewarding but so is recreating a functional replica of an anesthetic device similar to that originally used by William Morton at Massachusetts General Hospital, Boston, on October 16th, 1846! There has been considerable research done into what the original ether inhaler actually looked like but the Morton Ether Inhaler is most

likely one of the very early models made for distribution around the time it was first used. It consists of a glass globe with an inlet for air to pass over an ether soaked sponge and an outlet with a brass and leather valve assembly and a glass mouthpiece for inhalation.

Fabricating the replica was a true collaborative effort and part of the pleasure was working with Dr. Dave Hodgson, a veterinary anesthesiologist at K-State who also happens to be my older brother! The

glassblowing wasn't terribly difficult but duplicating the look of the original and fitting it to the brass valved inserts was challenging. Perhaps the most difficult part from a scientific glassblowing perspective was fabricating the glass mouthpiece mentioned in the descriptions. The effort was aided considerably by numerous photographs of the inhaler in the collection and even scaled drawings from 1965. You can read a fascinating article about the Morton Ether Inhaler at the link below. The pictures shown here are the fully functional model made here at K-State and also the glass mouthpiece.

https://journals.lww.com/anesthesia-nalgnesia/fulltext/2013/11000/researches_regarding_the_morton_ether_inhaler_at.29.aspx



James Robert Hodgson

Undergraduate Scholarships Awarded for 2022-2023

Jackson Adams, Wichita: the Jack and Betsy Lambert Scholarship

Benjamin Biggs, Manhattan: the H. H. King Memorial and the James A. Branson Memorial Scholarships

Nicholas Bougher, Olathe: the H. H. King Memorial and the Raymond A. Voet Scholarships

Jayden Brandt, Topeka: the Jerry and Judy Reed Scholarship

Cole Burenheide, Lawrence: the Manzo-Lathrop Scholarship

Anabela Chavez, Wichita: the Jack and Betsy Lambert Scholarship

Dalton Crouch, Osawatomie: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Aubrie Culver, Wichita: the Georganne Fowler Hiser Chemistry Scholarship

Maya Daily, Salina: the H. H. King Memorial and the Nancy Mundwiler- and Bruce Peters Scholarships

Tyler Davis, Wakarusa: the Future Chemists Scholarship and the Jack and Betsy Lambert Scholarship

Rachel Deters, Springfield, MO: the Jack and Betsy Lambert Scholarship

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

Maeci Exline, Salina: the Jack and Betsy Lambert Scholarship

Madysen Farr, Wamego: the ACS Hach Scholarship

Erin Frenk, Fedonia: the Jack and Betsy Lambert Scholarship

Sebastian Gary, Goddard: the Jack and Betsy Lambert Scholarship

Delaney Godby, Topeka: the Jack and Betsy Lambert Scholarship

Peter Gorges, Viola: the Jack and Betsy Lambert Scholarship

Joseph Hanford, Derby, the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Jack Hensen, Davis Junction, IL: the Eugene E. Howe Scholarship

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

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

Caleb Kline, Salina: the Joseph V. Paukstelis Memorial Scholarship and the Jack and Betsy Lambert Scholarship

Caroline Lander, Leawood: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Karrin Larson, Clay Center: the M. Dale and Janet Hawley

Scholarship and the Douglas L. Nelson Chemistry Scholarship

Lindsey Mehl, Wichita: the Jack and Betsy Lambert Scholarship

Mason Metcalf, Wichita: the Jack and Betsy Lambert Scholarship

Luis Morales, Dodge City: the Null Family Scholarship

Anthony Nistico, Manhattan: the Future Chemists Scholarship

Zetta Noll, Winchester: the Jack and Betsy Lambert Scholarship

Ana Olivar-Palacios, Wichita: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Evan Orme, Lenexa: the Jack and Betsy Lambert Scholarship

Rachel Pang, Overland Park: the Bernasek Family Scholarship

Lauren Phillips, Colorado Springs, CO: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Ryan Pierce, Riley: the George and Linda Hawks Scholarship Award in Chemistry

Broderic Rathbone, Hillsboro: the ACS Hach Scholarship

Marrissa Raynesford, Hays: the Herbert C. Moser and the Jerry P. and Geraldine L Hefling Scholarships

Nicole Saylor, Wichita: the Isobel and Dale Smith Scholarship

Santiago Smith, Kansas City, MO: the Jack and Betsy Lambert Scholarship

Sophia Schmidt, Wichita: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Brandon Stedry, Ballston Spa, NY: the Jerry and Judy Reed Chemistry Scholarship

Laney Smith, Lees Summit, MO: the Jack and Betsy Lambert Scholarship

Morgen Sumler, Lees Summit, MO: the Isobel and Dale Smith Chemistry Scholarship

Caroline Venteicher, Olathe: the Lewis A. and Opal D. Gugliemelli Memorial Scholarship in Chemistry

Jordan White, Shawnee: the Dow-KSU Alumni Scholarship



A Note of Thanks

Our department presently awards 30 distinct scholarships to our undergraduates. The total amount awarded for the 2022-2023 academic year is over \$176,000. This valuable assistance helps reduce the amount of time our students must spend working to meet their expenses, and allows them to concentrate more on their studies. In other cases, it helps them avoid student loans. This assistance may allow them to enroll in additional courses that they could not otherwise afford. 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.

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, 2021 to May 31, 2022 is shown below. We are grateful to all our faithful alumni and friends for their continued support!

Undergraduate Student Scholarships: \$170,450

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: \$87,857

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

General Departmental Support: \$75,214

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.

Departmental Excellence Funds: \$106,944

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.

News from 2021-2022

An Endowed Chair for Chemistry

The Department of Chemistry and the College of Arts and Sciences are thrilled to announce the establishment of the first endowed chair in our department. The Tim Taylor Chair in Chemistry was formally established this past academic year by a generous gift from Mr. Timothy G. Taylor. Mr. Taylor received his B.S. degree in Chemical Engineering from Kansas State University in 1975. During his time here, he took several courses in chemistry and fondly remembers spending time in our classrooms and labs. He has remained in contact with us since and had previously expressed interest in helping our department continue its strong upward trajectory. After graduating from K-State, Mr. Taylor started his career as a process engineer at Texas Eastman Company. He has since retired from Phillips 66 Company, where he recently served as president. He also served as president and as a director of Phillips 66 Partners GP, LLC. Mr. Taylor and his wife, Sharon, live in Houston, Texas. The Tim Taylor Chair in Chemistry will be held by the Head of the Chemistry Department. With his gift, Mr. Taylor will have a profound and lasting impact on our department and its educational mission.

New Department Head – *Continued from p. 2*

granting department. There is no shortage of graduate student applications, and this year in particular looks exceptionally promising, with a large domestic group starting in the Fall, but the number of undergraduate chemistry majors have fallen and this needs to be rectified.

We need improved and expanded access to state-of-the-art instrumentation in order to deliver on our research mission. Not only will a better research infrastructure help and support ongoing research projects in our department, it will also facilitate recruitment and retention of new faculty, graduate, and undergraduate students.

Finally, the importance of promoting diversity, inclusion, equity, and a sense of belonging throughout our profession cannot be overstated. Chemistry, commonly referred to as the central science, is both multidisciplinary and transformative. However, if we want to find game-changing solutions to global challenges, then we need to recognize that this can only be accomplished through a more diverse workforce, where each individual is given equal access to opportunities and resources.



P.S. If you are a former student from our department, and you happen to find yourself on Campus, please stop by and say hello. I'd love to connect with you and learn about your post K-State story!

Transitions in the Chemistry Department

Departures

As sometimes happens, people who have long been associated with our department decide it is time to pursue other career pathways. During the 2021-2022 academic year we lost two valuable members of our staff: Ron Jackson, our departmental machinist and Dr. Simon Sham, our instrument lab director. Ron played a significant role in our department, designing and manufacturing all kinds of unique equipment, repairing both commercial and home-built instruments, and serving as our go-to person for all kinds of maintenance issues. His presence has been greatly missed since his departure in late 2021. Simon played an integral role in our research program by serving as our NMR staff scientist. He trained many students in the design of sophisticated NMR experiments, and in the collection and interpretation of NMR data. He also worked to assist researchers from our department and from Psychological Sciences, Anatomy and Physiology, Electrical and Computer Engineering, and the KU Medical School on small-animal magnetic resonance imaging experiments. Simon departed from our program in mid-May of 2022. Our new NMR staff scientist will fill a joint position shared between our department and Biochemistry and Molecular Biophysics. Simon's knowledge of our instruments and his NMR skills will be greatly missed!

A New Arrival

We are pleased to have recruited a new member of our teaching faculty in late 2021: Dr. Radhika Reddy Nareddy. Radhika has been helping us staff our General Organic Chemistry, Organic Chemistry I, and Organic Chemistry II courses throughout the 2021-2022 academic year. She received her Ph. D. in organic chemistry from Mississippi State University in fall 2016, before moving to a job in a chemical company. She then moved to the University of South Carolina, where spent three years teaching their undergraduate courses in organic chemistry.

Bachelor of Science

Jennifer Breiling, Daja Coker,
Amanda Currie, Kaitlyn Franz,
Liliana Gonzalez, Trae Megaffin,
Chahat Sehgal, Jacob Suiter

Graduate Degrees

Anjana D. Acharige, Ph.D.

Major Prof: Stefan Bossmann
Title: Designing Novel
Thiosemicarbozone Cu(I) Complexes
Against Gram Positive MSSA and
MRSA.

Basanta Acharya, Ph.D.

Major Prof: Viktor Chikan
Title: Drug Release Study from
Flexible and Rigid Drug Carrier
Systems Under Inhomogeneous
Pulsed Magnetic Fields with
Applications in the Molecular
Transport into Cells.

Elizabeth N. Cooper, M.S.

Major Prof: Peter Sues
Title: Investigations into Dianionic
Scorpionate Ligands and their Metal
Complexes.

Jose J. Covarrubias, Ph.D.

Major Prof: Stefan Bossmann
Title: Rational Chemical
Applications of Explosion-Graphene.

Kayla M. J. Eschlman, Ph.D.

Major Prof: Stefan Bossmann

Recent Graduates

Title: Synthesis of a Small Library of
Copper Activated NNSN Molecules for
the Treatment of Bacterial Infections and
Cancer.

Anthony J. Fatino, Ph.D.

Major Prof: Ryan Rafferty
Title: Total Synthesis of Reniochalistatin
E and Synthetic Efforts Towards
Lagunamide C.

Sandun Gajaweera, M.S.

Major Prof: Paul Smith
Title: Development of Kirkwood-Buff
Derived Force Fields for Phospholipids.

Shu Jia, Ph.D.

Major Prof: Chris Culbertson
Title: Development of Microchip
Isoelectric Focusing and Scanning Laser
Induced Fluorescence Detection for
Simultaneous Enzyme Activity.

Kamalambika Muthukumar, Ph.D.

Major Prof: Jun Li
Title: Design and Development of
Hybrid Cathode Structures for Aqueous
Zinc Ion Battery Systems.

Pratima Pandeya, Ph.D.

Major Prof: Christine Aikens
Title: Optical Properties and
Electron/Nuclear Dynamics of
Nanoparticles.

Vinu V. Panikkattu, Ph.D. Major
Prof: Christer Aakeröy

Title: From Competing Inter-
molecular Interactions to Crystal
Engineering of New Materials: Theory
and Experiment.

Macy M. Payne, Ph.D.

Major Prof: Stefan Bossmann
Title: Practical Imaging and Analyses
for qMRI.

Kanchana Samarakoon, Ph.D.

Major Prof: Tendai Gadzikwa
Title: Enzyme-Inspired Metal-Organic
Framework Materials for Supra-
molecular Catalysis.

Pratikshya Sharma, Ph.D.

Major Prof: Viktor Chikan
Title: Colloidal Synthesis and
Characterizations of Metal, Metal-
Oxide, and Semiconductor
Nanoparticles by Inductive Heating
Method.

Gowri U. K. Singappulige, Ph.D.

Major Prof: Christine Aikens
Title: Fundamental Principles Behind
Plasmon-Induced Processes in
Polarizable Systems,

Zongbo Tong, Ph.D.

Major Prof: Duy Hua
Title: Studies of Bimetallic
Nanocatalysts and Synthesis of
Tricyclic Pyrone Molecules for
Alzheimer's Disease.

A New Curriculum

We have developed a new five-year, concurrent B.S. Chemistry/M.B.A. program in partnership with our College of Business Administration. A substantial number of our Chemistry graduates pursue careers in chemical industry and would benefit from having training in business. In fact, many have gone on to obtain M.B.A. degrees after completing their B.S. in Chemistry. By offering a concurrent B.S./M.B.A. degree, we hope to offer our students a more efficient route to completing both degrees. We hope to first offer this degree beginning in 2023.

Recognition and Awards

Faculty and Staff	Graduate Students
<p>Bart Bath: PLU Chemistry Department Distinguished Service Award, 2021</p> <p>Viktor Chikan: Awarded a Fulbright: John von Neumann Distinguished Award in STEM for 2022-2023</p> <p>Jun Li: Named a Fellow of the Royal Society of Chemistry, 2021. Named a Fellow of the International Association of Advanced Materials, 2022.</p>	<p>Shana Havenridge (Aikens): PLU Award</p> <p>Ivina Mali (Bossmann) and Zhen Liu (Aikens): Graduate Research Award</p> <p>Vinu Panikkattu (Aakeröy): Mitsugi Ohno Award</p> <p>Archana Sekar (J. Li) and Omid Shafiee (Higgins): Meloan Award in Analytical Chemistry</p> <p>Olivia Hull (Aikens): Department of Energy Computational Science Graduate Fellowship</p>
Undergraduate Students	<p>Viraj DeSilva: Fateley-Hammer Collaboration Award</p> <p>Shashika Perera (Rafferty): Scott Fateley Memorial Award</p> <p>Pricilla Matseketsa (Gadzikwa): John Berschied and Donna Derstadt Fellowship</p> <p>Logan Trowbridge (Sues): Jerry and Judy Reed Fellowship</p> <p>Shin Suh (Smith): Jerry and Judy Reed Fellowship</p> <p>Asantha Fernando (Rafferty): Noticxe Fellowship</p> <p>Zhen Liu (Aikens): Chemistry Department Summer Fellowship</p> <p>Abigail Kreznor (Culbertson): Johnson Cancer Research Center Fellowship</p> <p>Bingun Habarakadage (J. Li): Johnson Cancer Research Center Fellowship</p>
<p>Daniel Hubin (Aakeröy): PLU Research Award</p> <p>Anthony Nistico: Senior PLU Classroom Performance Award</p> <p>Karrin Larson and Rachel Pang: Junior PLU Classroom Performance Award</p> <p>Nicholas Bougher and Jane Eilers: Sophomore PLU Classroom Performance Award</p> <p>Maya Daily and Marrison Raynesford: Freshman PLU Classroom Performance Award</p>	
<p>Student photos: Commencement and Scholarship Banquet – Spring 2022. Photo credit: Ryan Rafferty.</p>	