



A NOTE FROM THE DEPARTMENT HEAD

Dear Alumni and Friends of the Chemistry and Biochemistry Department:

We hope our annual newsletter finds you well. Once again, it's time to reflect on the events in our department over the past year. 2022 was the year in which we fully transitioned to "normal" operations after a couple of years of uncertainty due to the COVID-19 pandemic. Jessica Quin joined our administrative staff team in fall 2022. She graduated with an associate's degree from Ozarks Technical Community College in Springfield, Missouri. She took over for Marla Fritz, who moved to another department in the University.

Despite the lingering effects of COVID-19 pandemic, 2022 was another very productive year. Faculty and students published 28 peer reviewed publications, two books, three book chapters, and one technical report. Faculty brought in over a half a million dollars in individual and collaborative external grants. Among these grants was an award of \$383,538 to Dr. Richard Biagioni, et al, from the National

Science Foundation to purchase a Liquid Chromatograph – Mass Spectrometer. Other new instruments in the department include a new Single Crystal X-ray Diffractometer, a new benchtop 100 MHz Nuclear Magnetic Spectrometer, a new Surface Plasmon Resonance and two new High Performance Liquid Chromatographs.

Our faculty were honored with various CNAS Faculty and Staff Excellence awards. They included Dr. Fei Wang (Research), Dr. Keiichi Yoshimatsu (Service), Dr. Gautam Bhattacharyya (Teaching), Scott Curtis (Staff), and Dr. Gary Meints (Student Nominated). Our students also had a very productive year. Thirty-one students graduated with bachelor's degrees, while nine

Continued on Page 2

IN THIS ISSUE:

A Note from the Dept. Head	Page 1-2
New Faculty and Staff	Page 2
General Announcements	Page 3
Faculty/Staff Accomplishments	Page 3-4
Intellectual Contributions	Page 5-7
Student Accomplishments	Page 8-11
Scholarship & Award Winners	Page 12
Group Photo	Page 13
Graduates 2022	Page 14
American Chemical Society	Page 15-16
Alumni Spotlight and News	Page 17-18
Giving	Page 18
Chemistry Board of Advisors	Page 19
Thank You / Publishing	Page 19

graduated with master's degrees. Another 22 students were awarded Foundations of Pharmaceutical Science Certificates. This translates to a total 63 completions for the 2022 calendar year, which is a record for the department. Undergraduate student, Preston Clubb, was awarded the Environmental Chemistry Award from the American Chemical Society. Preston works in Dr. Cyren Rico's lab where he investigates the effects of widespread soil contaminants on plants.

Mike Ebbers (BS 1985) joined the Chemistry and Biochemistry Department Board of Advisors. Mike is currently the Vice-President of Regulatory Affairs, Steris Corporation, in St. Louis, Missouri. Welcome aboard, Mike! The Board of Advisors formed the "MSU Chemistry and Biochemistry Department Instrument Purchase, Repair and Maintenance Fund" last fall. The purpose of the fund is to supplement the department's needs for instrument repairs, routine maintenance, consumable items, and/or purchase. The fund is up and running and has already received some donations.

In closing, we thank our alumni and friends for their continued support. We look forward to strengthening these relationships. I hope 2023 will be prosperous to you, both personally and professionally.

Adam Wanekaya
Head, Chemistry and Biochemistry Department
Missouri State University
Springfield, Missouri

WELCOME NEW FACULTY AND STAFF



Jessica Quin

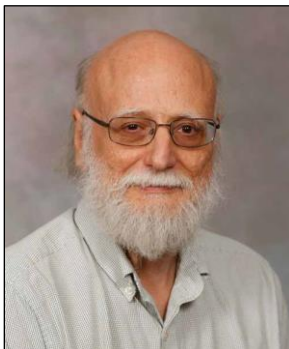
Introducing Jessica Quin, Academic Administrative Assistant II

Jessica joined the Department of Chemistry and Biochemistry in September 2022. She is a native of Springfield and is a graduate of Willard High School and OTC. Serving in Administrative Assistant roles for the last 7 years, she enjoys the challenge of learning new things and is always happy to help wherever possible.

GENERAL ANNOUNCEMENTS



Marla Fritz, Currently an Admin Assistant, Donor Relations and Special Events at MSU Foundation



Richard Biagioni
Retiring in 2023



Eric Bosch
Retiring in 2023

After many years of service and countless donations, Robert Lloyd Ernst has formerly resigned from the Board of Advisors.

FACULTY / STAFF ACCOMPLISHMENTS

January 1 – December 31, 2022

Tuhina Banerjee awarded an NIH AREA 15 grant for “Investigation of Membrane Fusion Interactions of Enveloped Viruses using Magnetically-Labeled Liposomes” (\$103,029).

NSF MRI Grant Award for Acquisition of a Liquid Chromatography - Mass Spectrometry System (\$383,538): Richard Biagioni, Natasha DeVore, Gary Meints, Cyren Rico, and Keiichi Yoshimatsu.

CNAS Faculty Awards Winners:

Gary Meints, Student-Nominated
Keiichi Yoshimatsu, Service
Fei Wang, Research
Gautam Bhattacharyya, Teaching
Scott Curtis, Staff Excellence

CNAS Dean Fellows:

Matt Siebert, Chemistry and Biochemistry (Faculty Mentoring and Development)

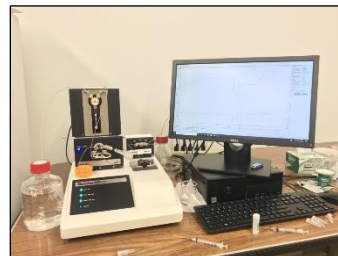
FACILITIES UPDATES – NEW INSTRUMENTS



Single Crystal XRD



Benchtop NMR



SPR Instrument



Agilent 1220 HPLC



Agilent 1220 HPLC

INTELLECTUAL CONTRIBUTIONS

January 1 – December 31, 2022

Bhattacharyya, Gautam*Book Chapters**Book, Chapter in Scholarly Book-New (Accepted)*

Bhattacharyya, G. Assessment of assessment in organic chemistry: Review and analysis of predominant problem types related to reactions and mechanisms. In Nicole Graulich and Ginger Shultz (Ed.), *Student Reasoning in Organic Chemistry (Advances in Chemistry Education Series)*. Cambridge: Royal Society of Chemistry (UK).

Bosch, Eric*Refereed Journal Articles*

Krueger, H. J., Shapiro, N. M., Bosch, E., Unruh, D. K., Groeneman, R. H. (2022). Influence of Secondary Interactions on Structural Diversity between a Pair of Halogen-Bonded Co-Crystals Containing Isosteric Donors. *Compounds*, 2, 285-292.

Bosch, E., Bowling, N., Speetzen, E. D. (2022). A structural and computational comparison of close contacts and intermolecular energies of interaction in the structures of 1,3-diiodo-5-nitrobenzene, 1,3-dibromo-5-nitrobenzene and 1,3-dichloro-5-nitrobenzene. *Acta Crystallographica, Section C*, 78, 552-558.

Powell, C. J., Ferrence, G. M., Bosch, E., Groeneman, R. H. (2022). Engineering solid-state photoreactivity within silver(I) organosulfonate complexes containing an ester-functionalized reactant molecule. *Journal of Coordination Chemistry*, 75, 1596-1605.

Bosch, E., Bowling, N. P. (2022). Cooperative halogen bonds and nonconventional sp-C-H...O hydrogen bonds in 1:1 cocrystals formed between diethynylpyridines and N-halosuccinimides. *Acta Crystallographica C: Structural Chemistry*, 78(7), 424-429.

Bosch, E., Ferrence, G. M., Powell, C. J., Unruh, D. K., Krueger, H. R., Groeneman, R. H. (2022). Cooperative non-covalent interactions and synthetic feed as driving forces to structural diversity within organic co-crystals containing isosteric perhalobenzenes. *CrystEngComm*, 24, 3841-3845.

Dunning, T. J., Bosch, E., Groeneman, R. H. (2022). Halogen-bonded zigzag molecular network based upon 1,2-diodoperchlorobenzene and the photoproduct rectt-1,3-bis(pyridin-4-yl)-2,4-bis(phenyl)cyclobutane. *Acta Crystallographica Section E*, 2022(E78).

Juneja, N., Shapiro, N. M., Unruh, D. K., Bosch, E., Groeneman, R. H., Hutchins, K. M. (2022). Controlling Thermal Expansion in Supramolecular Halogen-Bonded Mixed Cocystals Through Synthetic Feed and Dynamic Motion. *Angewandte Chemie International Edition*, 61, e202202708(1/5).

Speetzen, E. D., Nwachukwu, C. I., Bowling, N. P., Bosch, E. (2022). Complementary, cooperative ditopic halogen bonding and elec-tron donor-acceptor pi-pi complexation in the formation of co-crystals. *Molecules*, 2022(27), 1527.

Bosch, E., Moreno, B. S., Bowling, N. P. Pi-Complexation and Nonconventional C-H Hydrogen Bonding in the Formation of Coloured Cocystals. *Acta Crystallographica, C: Structural Chemistry*.

*Other Intellectual Contributions**Technical Report (Published)*

Bosch, E., Bowling, N. P. (2022). 5-{{4-(Dimethylamino)phenyl}ethynyl}pyrimidine-1,2,3,5-tetrafluoro-4,6-diodobenzene). *IUCR Data*, 7, x220380 (1/2).

DeVore, Natasha M.*Refereed Journal Articles**Journal Article, Academic Journal (Published)*

Anderson, M., DeVore, N., Padgett, C., Dargatz, C., Nichols, C., & Vittalam, K. (2022). Engineering a Yellow Thermostable Fluorescent Protein by Rational Design. ACS Omega DOI: 10.1021/acsomega.2c05005. <https://pubs.acs.org/doi/pdf/10.1021/acsomega.2c05005>

Continued...

Gerasimchuk, Nikolay N.

Books

Book, Textbook-New (Published)

Gerasimchuk, N. N. (2022). *Chemical Literacy and Writing Chemical Reactions*. (pp. 264 pp.). Cambridge Scholars Publishing, Newcastle upon Tyne: Lady Stephenson Library, NE6 2PA, UK.

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2022). Rational Design of Iron Spin-Crossover Complexes Using Heteroscorpionate Chelates.. *Inorganic Chemistry*, 2022.

Journal Article, Professional Journal (Published)

Gerasimchuk, N. N. (2022). Lithium Selenometallates of Trier Elements, Li₅MSe₄ (M = Al and Ga), Aliovalent Doping and Their Ionic Conductivity.. *Dalton Transactions*.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2022). Non-Antibiotic Antimony-Based Antimicrobials. *Molecules, MDPI journal*, 27, 7171-7191.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2022). Nickel(II) Aqua Complexes with Chelating Ligands: What Happens When Water Is Gone?. *Crystal Growth & Design*, 22, 6168–6182.

Journal Article, Academic Journal (Published)

Adedamola, A. O., Hietsoi, O., Gerasimchuk, N. N. (2022). Structural characterization of products in the Ni(II) – 2-oximino-2-cyan-N-piperidineacetamide (HPiPCO) system.. *Journal of Molecular Structure*, 1258, 132646.

Journal Article, Academic Journal (Published)

Hollandsworth, C., Pruden, J. R., Clark, W., Gerasimchuk, N. N. (2022). X-ray structural determination and comparison of Bis-imine Schiffbases with trans - and cis -1,2-cyclohexanediamine backbones. *Journal of Molecular Structure*, 1255(2022), 132430.

Other Intellectual Contributions

invited seminar at Pittsburgh State University (KS) (Accepted)

Gerasimchuk, N. N. Chemistry of Cyanoximes. In invited by Prof. Jody Neef (Ed.), no. Pittsburgh, KS:.

public lecture at English Language Institute. (Accepted)

Gerasimchuk, N. N. Metal Based Drugs. no.

invited seminar at Kansas State University (Accepted)

Gerasimchuk, N. N. Chemistry and Applications of Cyanoximes and Their Metal Complexes. Invited by Prof. Socrates Munoz (Ed.), no. Manhattan, KS.

oral talk at Midsouth Inorganic Chemists Association (MICA; Fall 2022) (Accepted)

Gerasimchuk, N. N. In Prof. Carl Hollandsworth (Ed.), *Solvent induced resolution of diastereomers of cyanoximes*.. Hot Springs, AR.

invited lecture at Saint Louis University (Accepted)

Gerasimchuk, N. N. CHEMISTRY AND APPLICATIONS OF CYANOXIMES AND THEIR METAL COMPLEXES. In invited by Prof. Paul Jelliss (Ed.), no. St. Louis, MO.

Meints, Gary A. J.

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Westwood, M. N., Johnson, C. C., Meints, G. (2022). Kinetics and thermodynamics of BI-BII interconversion altered by T:G mismatches in DNA. *Biophysical Journal*, 121(9), 1691-1703.

Rico, Cyren

Books

Book, Scholarly-New (Published)

Rico, C. (2022). Plant Exposure to Engineered Nanoparticles Uptake, Transformation, Molecular and Physiological Responses. In Cyren Rico (Ed.), *Nanomaterial-Plant Interactions Book Series* (vol. 3). Elsevier.

Book Chapters

Book, Chapter in Scholarly Book-New (Published)

Rico, C., Polycarp, O. C., Kirwa, N. J., Wagner, D. C., Abolade, O. M., Jia, S., Hong, J. (2022). Changes in metabolite profile of plants exposed to engineered nanomaterials. In Cyren Rico (Ed.), *Plant Exposure to Engineered Nanoparticles Uptake, Transformation, Molecular and Physiological Responses*. Elsevier.

Book, Chapter in Scholarly Book-New (Published)

Andersen, C. P., Rico, C. (2022). The importance of system complexity in understanding plant responses to engineered nanoparticles: direct versus indirect effects. In Cyren Rico (Ed.), *Plant Exposure to Engineered Nanoparticles Uptake, Transformation, Molecular and Physiological Responses*. Elsevier.

Continued...

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Ofoegbu, P. C., Wagner, D. C., Abolade, O. M., Preston, C., Dobbs, Z., Sayers, I., Zenobio, J. E., Adeleye, A. S., Rico, C. (2022). Impacts of perfluorooctanesulfonic acid on plant biometrics and grain metabolomics of wheat (*Triticum aestivum* L.). *Journal of Hazardous Materials Advances*, 7.

Journal Article, Professional Journal (Published)

Ying, S., Guan, Z., Ofoegbu, P., Clubb, P., Rico, C., He, F., Hong, J. (2022). Green synthesis of nanoparticles: Current developments and limitations. *Environmental Technology & Innovation*, 26, 102336.

Wang, Fei

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Roy, N., Harshit, Mondal, A., Wang, F., Jana, P. (2022). Structural and Theoretical Investigations on the Unique Coloring Scheme of the γ -Brass Type Phase: $\text{Cu}_{5+\delta}\text{Cd}_{8-\delta}$ ($-1.0 \leq \delta \leq 0.1$). *Zeitschrift für anorganische und allgemeine Chemie*.

Journal Article, Academic Journal (Published)

Adamson, M., Yox, P., Hernandez, T., Wang, F., Vela, J. (2022). Phase Evolution, Polymorphism, and Catalytic Activity of Nickel Dichalcogenide Nanocrystals. *Chemistry of Materials*.

Journal Article, Academic Journal (Published)

Stefano Bardelli, Zhengyang Ye, Fei Wang, Bingbing Zhang, Jian Wang, (2022) "Synthesis, Crystal and Electronic Structures, and Nonlinear Optical Properties of $\text{Y}_4\text{Si}_3\text{S}_{12}$ ", *Zeitschrift für Anorganische und Allgemeine Chemie*. 648, e202100388.

Journal Article, Academic Journal (Published)

Nilanjan Roy, Harshit, Amit Mondal, Fei Wang, Partha P. Jana, (2022) "Structural and Theoretical Investigations on the Unique Coloring Scheme of the γ -Brass Type Phase: $\text{Cu}_{5+\delta}\text{Cd}_{8-\delta}$ ($-1.0 \leq \delta \leq 0.1$)", *Zeitschrift für Anorganische und Allgemeine Chemie*. 648, e202100354.

Journal Article, Academic Journal (Published)

Bingheng Ji, Kui Wu, Yunhua Chen, Fei Wang, Aaron J. Rossini, Bingbing Zhang, and Jian Wang, (2022) "Ba₆(CuxZy)Sn₄S₁₆ (Z = Mg, Mn, Zn, Cd, In, Bi, Sn): High Chemical Flexibility Resulting in Good Nonlinear-Optical Properties", *Inorganic Chemistry*. 61(5), 2640–2651.

Journal Article, Academic Journal (Published)

Dissanayaka Mudiyansele, Martha Greenblatt, David Walker, and Weiwei Xie, (2022) "Eu₂Mg₃Bi₄: Competing Magnetic Orders on a Buckled Honeycomb Lattice", *Chemistry of Materials* 34(9), 3902–3909.

Journal Article, Academic Journal (Published)

Jiwei Wang, Grayson Hoteling, Robert Shepard, Matthew Wahila, Fei Wang, Manuel Smeu, and Hao Liu, (2022), "Reaction Mechanism of Na-Ion Deintercalation in Na₂CoSiO₄", *Journal of Physical Chemistry C*, 126(40), 16983–16992.

Journal Article, Academic Journal (Published)

Nilanjan Roy, Sandip K. Kuila, Amit Mondal, Ritobroto Sikdar, Harshit, Sivaprasad Ghanta, Fei Wang, Partha P. Jana, (2022), "Crystal structure, electronic structure and phase stability of the Cu_{2-x}M_xCd (M=Zn, Ga, Ge, Sn) pseudo-binary Laves phases: Effect of valence electron concentration", *Journal of Solid State Chemistry*, 313, 123283.

Journal Article, Academic Journal (Published)

Krishna Pandey, Lauren Saylor, Rabindra Basnet, Josh Sakon, Fei Wang, and Jin Hu, (2022), "Crystal Growth and Electronic Properties of LaSbSe", *Crystals*, 12(11), 1663.

Continued...



STUDENT ACCOMPLISHMENTS



Preston Clubb

Undergraduate Preston Clubb Earns Environmental Chemistry Award

The American Chemistry Society bestows the award for excellence. The American Chemical Society (ACS) Division of Environmental Chemistry presented Preston Clubb, a Missouri State University Senior majoring in chemistry, with the 2022 Undergraduate Student Award in Environmental Chemistry. His accomplishments in academic science and team research are honored by the award. Clubb's research advisor and nominee for the honor is Dr. Cyren Rico, an assistant professor of the Chemistry & Biochemistry Department. Clubb studies the

impact of emerging contaminants on plants in Rico's lab together with other students and collaborators around the world. This covers individuals who injure edible agricultural crops like wheat, barley and soybean as well as the people who consume them.

“The general community must be aware of how new contaminants affect their food supply. When a known threat is released into the environment (much like PFOS) and harms our crops, action must be taken to reduce that threat,” Clubb says.

Clubb focuses on cerium oxide nanoparticles (CeO_2 -NPs): a compound that pose risks to agriculture crops due to the stability for it to remain in its nanoparticulate form. While recent research has explored the nutritional implications when being exposed to CeO_2 -NPs, generational exposure scenarios have yet to address the mechanisms that are affected by the contaminant.

“We are interested in how the plant, in this case wheat, responds to contamination exposure across several generations. As the wheat is grown and harvested, those seeds are exposed once more as the wheat is grown and harvested, and then we repeat the process a third time,” according to Clubb. “A third-generation scenario requires a lot of time, thankfully we only do that generation here, but the outcomes are worthwhile.”

When spending that much time, it requires a strong work ethic where good work often starts. Clubb's outstanding work ethic has helped him achieve several successes during his time as a student. Among these accomplishments are creating lab protocols for Dr. Rico, presenting at the CNAS Undergraduate Research Symposium, and winning the Outstanding Environmental Chemistry Student Award from the Chemistry & Biochemistry Department. His research contributions have contributed to the co-authorship of two publications, with many more submitted for peer-review.

Clubb considers the ACS Award and the success a blessing and plans to continue his studies as a master's student in the fall. “I'm thankful for the opportunity that Dr. Rico has given me in his lab, and the professors in the department for answering my many questions.”

Clubb will receive a one-year membership in the ACS Division of Environmental Chemistry as the award recipient. He will also have publicized recognition as an awardee on the division's website.

Congratulations, Preston!

Outstanding Senior – Mya Bhinhar

I have always been driven to succeed academically but Missouri State University has allowed me to establish myself as an individual thinker and leader. I have created quality relationships with my peers and mentors through athletics and academics. The science faculty has supported me as a collegiate athlete, student, and individual. While balancing my athletic career and studies I was able to learn time management, communication, and teamwork.

The chemistry department at Missouri State is filled with doctors and professors who are determined to create an atmosphere for students to be successful. The teachers in this institution have inspired me through the rigorous curriculum and research I have completed. During my time at Missouri State, I conducted research with Dr. Herati, studying the effects different polymers had when binding to chitosan. In my specific research, I studied dynamic light scattering (DLS) and electrophoretic light scattering (ELS) with DNA using BABC1-MPEG and BPBC1-MPEG. Through this research, I established a greater understanding of polymer chemistry and was introduced to new techniques.

Experiences in research, lectures, and collaboration with scholarly individuals has made me appreciate my education at Missouri State. I will forever be grateful for the faculty's dedication to my academic endeavors and their impact on my education. I am looking forward to applying what I learned at Missouri State and continuing to cultivate my knowledge of chemistry.

-Mya



Mya Bhinhar

National Organization for the Professional Advancement of Black Chemists and Chemical Engineers Advancing Science Student Grant

Olamide Ogundele attended the 49th Annual National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) Conference, held September 26-29, 2022, in Orlando, Florida. The mission of NOBCCChE is to build an eminent cadre of successful and diverse global leaders in STEM and advance their professional endeavors by adding value to their academic development, leadership, and philanthropic endeavors throughout the lifecycle of their careers. Olamide received a grant tagged 'Advancing Science Conference Grant,' identifying her one of the country's best and brightest upcoming scientists. Of the experience, Olamide said, "It was a great opportunity to talk about the effect of Generational exposure of perfluorooctanesulfonic acid (PFOS) to important food crops, and after sharing my findings and learning from other colleagues in attendance, I got important feedback that made me intensify my research. In addition, I experienced my first hurricane in Orlando during the conference, and I am not going to forget how the organizers of NOBCCChE cared and made the attendees feel safe amidst the crisis. I look forward to attending more NOBCCChE conferences."

-Olamide



Olamide Ogundele

Masters Students Present at the Sustainable Nanotechnology Organization Conference

The 11th Sustainable Nanotechnology Organization (SNO) Conference was held in Austin, Texas this past month where roughly 100 people were invited to present. This conference provided a forum where scientists, engineers, and other professionals exchange information and ideas for the development and use of nanotechnology leading to overall sustainability. The conference also showcased NanoPitch, where students must pitch a nano research topic in under 100 seconds. Naum Kirwa and Preston Clubb, both from Dr. Cyren Rico's lab, were invited to present over their research.

Kirwa presented her research over "Metabolomics reveal size-dependent impacts of cerium oxide nanoparticles (CeO₂-NPs) on barley grains" while Clubb presented on "Generational exposure to cerium oxide nanoparticles alters the performance of wheat (*Triticum aestivum* L.) exposed to perfluorooctanesulfonic acid."

The conference included many seminars and table talks from prominent people in the profession that discussed nanoparticle effects on food and agriculture, microplastics in the environment, and even nanotechnology education in today's setting.

Kirwa said that the conference helped her communicate her research to students from multiple field disciplines. "When you have an interdisciplinary research project that we are doing, understanding how to properly discuss your research with others is vital. If you cannot do that, you may not even understand what you are researching," Kirwa said.



Naum Kirwa and Preston Clubb



Preston Clubb and Dr. Adeyemi Adeleye



Naum Kirwa

While meeting his co-advisor, Dr. Adeyemi Adeleye, was certainly a highlight of the conference, Clubb said that developing better critical thinking and soft skills was important. "Critical thinking and soft skills go hand in hand. When you develop a strong work ethic, teamwork, leadership, and communication skills- not only are you more able to question assumptions but exercise your curiosity. It also helps to take perspective of your knowledge and strengths, as well as what you don't know or are less good at," Clubb said. "It has helped me become a better researcher."

The conference also recognizes outstanding students and their contributions to the field. Clubb received the SNO Student Award for the second year in a row which supports only a handful of graduate and undergraduate students at the conference. He received the award at the annual Gala Dinner.

"I am thankful for SNO's support and inviting me to attend the conference. It was an amazing experience," Clubb says.

While Kirwa is graduating this semester, Clubb hopes to attend next year and present new and exciting research that they are conducting.

Symposium Winners 2022

Chemistry and Biochemistry

1st Place: Krusha Bhakta

Biophysical Studies of DNA Backbone Interconversion and Dynamic Properties via NMR

Faculty Advisor: Dr. Gary Meints

2nd Place: Cassidy Soard

Sensitive Detection of Ebola Virus using Functional Nanosensor

Faculty Advisor: Dr. Tuhina Banerjee

2022 3-Minute Theses Winners

Dhruv Sitapara, CHM

Olamide R. Ogundele, CHM

Autumn Pilarski, CHM

28th Annual Graduate Einhellig Interdisciplinary Forum Winner

Megan Prado – Outstanding Poster

American Chemical Society Officers 2022

President: Brooke Winder

Vice President: Tanner Rust

Secretary: Oluchi Nweke

Treasurer: Joe Truong



2022 SCHOLARSHIP AND AWARD WINNERS

Chemistry Dept. Scholarship Fund	Krusha Bhakta
Chemistry Dept. Graduate Scholarship	Naum Kirwa
Chemistry Board of Adv. Summer Research Fellowship	Elson Eguaosa, Haylee Grannemann, Lane Spillman
Doris C. Lorz Scholarship	Acacia Jurkowski, August Schwoebel, Jessica Linson
Dr. Robert W. Martin Research Fellowship	Krusha Bhakta, Alexis Rapert, Logan Jennings, Maximo Reyes, Courtney Burlingame
Emil Lorz Memorial Scholarship	Lydia Lang, Victoria Ogbeifun
Eugene T. Scafe Memorial Scholarship	Renewal: Acacia Jurkowski- New: Calysta Nichols, Ethan Barney Stavro, Courtney Burlingame, Maximo Reyes, Krusha Bhakta
Harriett H. Ford Memorial Scholarship	Tanner Hirschi
Harthcock Chemistry Research Fellowship	Lauren Sayler, Hannah Lundien
Louise & Roland Harthcock Scholarship	Samantha Ball
Robert Lloyd Ernst Summer Graduate Assistantship	Giselle Campos, Hannah Lundien
Robert S. Christie Memorial Scholarship* *(all candidates confirmed by Scott Curtis)	Lauren Sayler, Emma Braun, Haylee Grannemann, Fantasia Critchfield, Caitlin Padgett Sarah Adeoye, Logan Jennings, Elson Eguaosa, Calysta Nichols
WEB & AOB Memorial Scholarship	Dhruv Sitapara, Sarah Adeoye, Elson Eguaosa
William J. Husa Chemistry Scholarship	Mackenzie Keller, Calysta Nichols
Wyman & Sue Grindstaff Chem. Education Scholarship	Lane Spillman
Foundation for Immunotoxicology Award	Caitlin Padgett
ACS Undergraduate Award in Inorganic Chemistry	Grace Atkins
ACS Undergraduate Award in Analytical Chemistry	August Schwoebel
POLYED Undergraduate Organic Chemistry Award	Krusha Bhakta
Outstanding Environmental Chemistry Student	Preston Clubb
General Chemistry Achievement Award	Victoria Ogbeifun, Nannan Dong
Outstanding Physical Chemistry Student Award	Krusha Bhakta
Outstanding Biochemistry Student Award	Haylee Grannemann
Outstanding Inorganic Chemistry Student Award	Darren Kirsch
Outstanding Student in Instrumental Analysis	Nicole Walker
Outstanding Senior	Mya Bhinhar

Molecules and Moles

Chemistry and Biochemistry
Department Newsletter: 2022



GRADUATES 2022

Congratulations on your Graduation! We are so Proud of You!

Spring 2022

Master's Degree

Seth Adu Amankrah
Jabez Campbell
Manuel Meyer

Bachelor's Degree

Zachary Baudendistel
James Beene
Mya Binhhar
Preston Clubb
Lauryn Corbell
Andrew Coulliette
Alexander Denny
Joshua Garland
Jane Jackovich
Collin Johnson
Gyeongsed Kim
Darren Kirsch
Clarissa Krimmel
Sarah Longworth
Qui Luong
Samia Mahmud
Gretchen Neuschwander
Claire Nieder
Rachael Rangel
Salvatore Raymond
Cassidy Soard
Andrew Stoll
Carissa Sutton
Trinity Takahashi

Undergraduate Certificate

Ezri Beckmann
Kristen Butrum
Sydney Dixon
Emily Downie
Drake Headrick
Shane McConnell
Hannah Nelson
Gabrielle Ramos
Carter Sadler
Megan Schultz
Kaelynne Schuneman

Summer 2022

Master's Degree

Giselle Campos
Alex McMullen

Bachelor's Degree

Acacia Jurkowski
Trieu Nguyen
Nicole Walker

Undergraduate Certificate

Makaela David
Helen Gardner

Fall 2022

Master's Degree

Jacqueline Baker
Naum Kirwa
Patricia McDaniel
Megan Prado

Bachelor's Degree

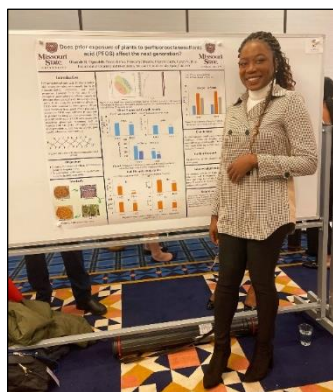
Courtney Burlingame
Marck Dragoi
Nicholas Engel
Mackenzie Keller
Crista Stover
Evelyn Struempf

Undergraduate Certificate

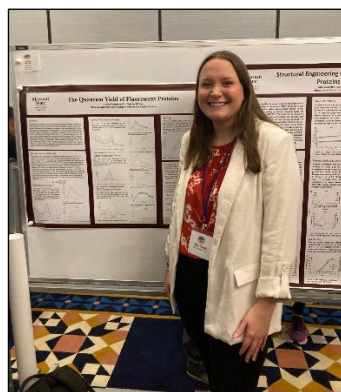
Rachel Haug
Grant Headrick
Nathan Kirkpatrick
Beatrice Marti
Christian Phillips
Mikenzie Ramming
Abigail Rea
Jessica Wickersham

ACS MIDWEST REGIONAL MEETING

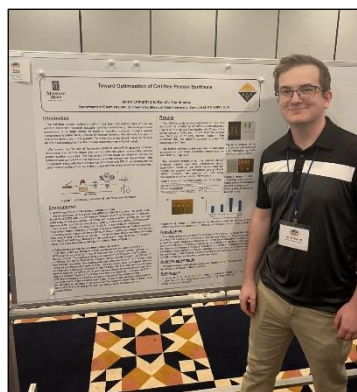
Numerous Chemistry Department students and faculty attended the 2022 ACS Midwest Regional Meeting held October 19-21, 2022, in Iowa City, Iowa. This year's theme was "Sustainable Chemistry: Leading Through Change" and provided MSU Chemistry Department's undergraduate and graduate students ample opportunity to present their research and make great contacts. In addition to networking opportunities and vendor expo displays, there were lots of plenary speakers, social events, poster and technical sessions. The American Scientific Glassblowers Society was also present. Here is a collage of photos from the event.



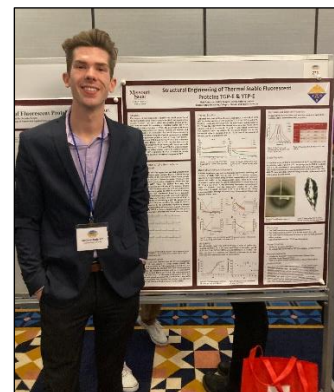
Olamide Ogundele



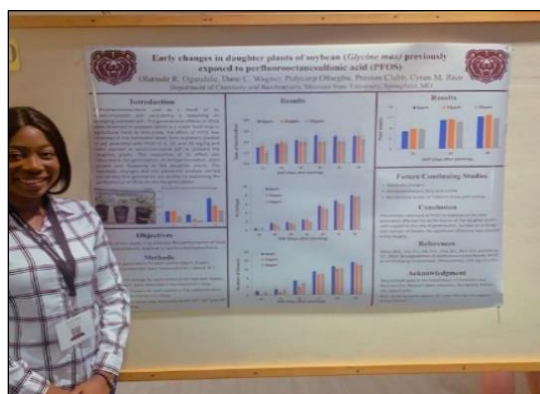
Caitlin Padgett



Jacob Linhardt



Matthew Anderson



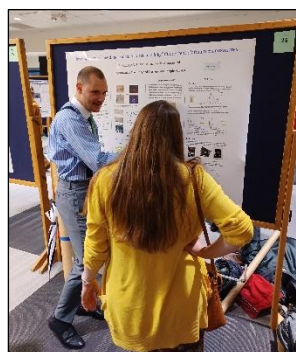
Olamide Ogundele



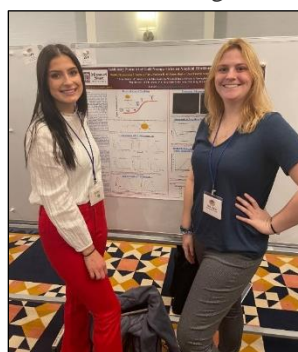
Matthew Anderson, Elson Eguaso,
Olamide Ogundele, Dhruv Sitapara, Naum Kirwa



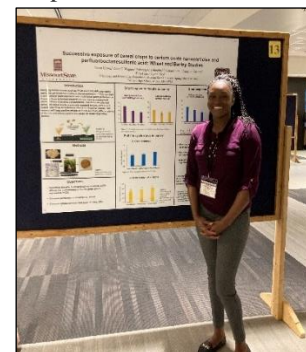
Naum, Olamide, Dhruv



Marck Dragoi, Natasha DeVore



Haylee Grannemann, Carissa Sutton



Naum Kirwa

ACS CONFERENCE PHOTOS - CONTINUED



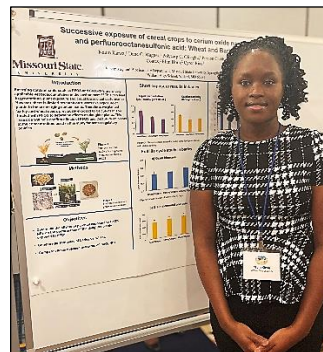
Marck Dragoi (L)



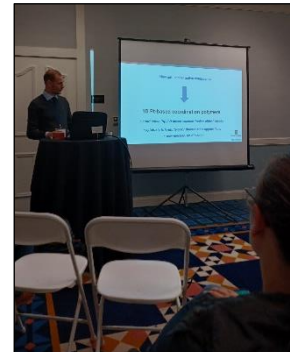
Dhruv Sitapara (R)



Carissa Sutton



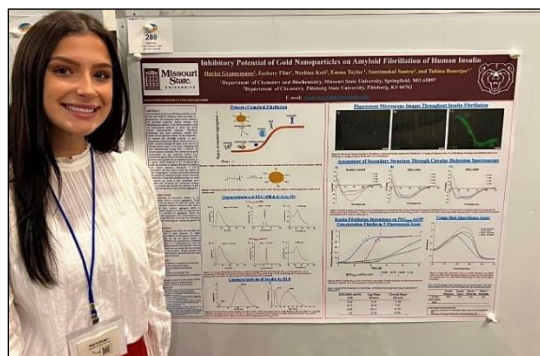
Naum Kirwa



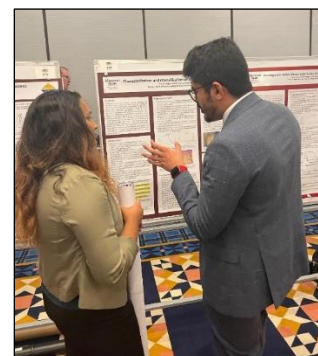
Marck Dragoi



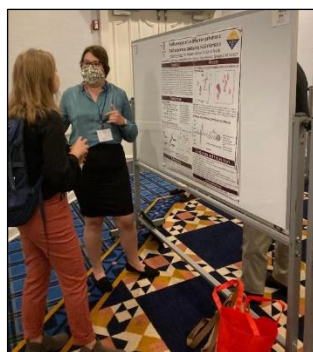
Dr. Nikolay Gerasimchuk (center)



Haylee Grannemann



Dhruv Sitapara (R)



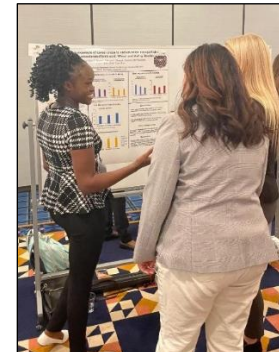
Autumn Pilarski (R)



Elson Eguaoa, Dhruv Sitapara



Olamide Ogundele (L)



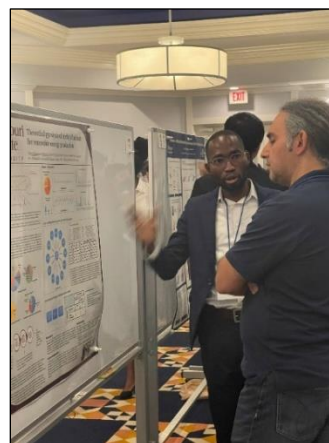
Naum Kirwa (L)

Molecules and Moles

Chemistry and Biochemistry
Department Newsletter: 2022



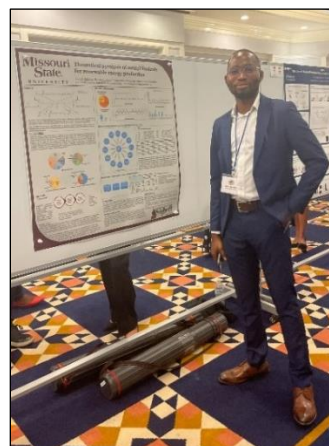
(L-R) Matthew Anderson, Elson Eguaosa, Olamide Ogundele, Dhruv Sitapara, Naum Kirwa



Elson Eguaosa



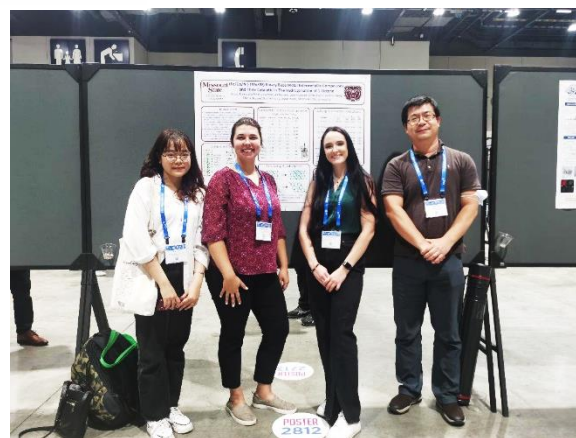
Caitlin Padgett



Elson Eguaosa



Prof. Fei Wang with An Nguyen, Lauren Sayler, and Crista Stover, at the ACS National Meeting in Chicago, August 21-25, 2022.



2022 ALUMNI NEWS AND UPDATES

- Bates, Brandy (MS 2019), QC Specialist, Nitto Avecia, Cincinnati, OH.
- Bruer, Jessica (BS 2019, MS 2020), Applications Scientist III, Sensient Food Color, St Louis, MO.
- Campos, Gissele (MS 2022), defended her master's thesis at MSU during Summer 2022 (M.Sc.), now attending Ph.D. program at University of Minnesota.
- Clubb, Preston (BS 2022), pursuing master's degree at Missouri State University, Springfield, MO.
- Davidson, Aaron (BS 2020), Sales Representative, Golden Harvest, Syngenta, Rockford, IL.
- DeCocq, Victoria (BS 2018, MS 2020), Analytical Chemist, Eurofilms/EAG Laboratories, St. Louis, MO.
- Fury, Jonathan (BS 2009), Associate Distribution Engineer, Leidos, Reston, VA.
- Garland, Joshua (BS 2022), pursuing master's degree at Missouri State University, Springfield, MO.
- Hill, Jeffrey (BS 2008), Senior Manager (Operations) Thermo Fisher Scientific, Washington DC - Baltimore area.
- Hayes (Verheyen), Lauren (BS 2011, MS 2012), Regulatory Quality System and Archives Lead, Bayer, St. Louis, MO, area.
- Hilton, Michael (MS 2013), Principal Scientist, Pfizer, Boulder, CO.
- Idowu, Olusegun (MS 2021), Quality Control Analyst II, Reckitt, Salt Lake City, UT.
- Khokhar, Mehwish (MS 2021), Marketing Manager, American Chemical Society, Washington, DC.
- Kim, Gyeongseo (BS 2022), now attending Ph.D. program at University of Texas at Dallas.
- Kinde, Monica (BS 2005, MS 2006), Associate Professor of Biochemistry and Interim Associate Dean of Curriculum and Integrated Learning, Kansas City University, Kansas City, MO.
- Kirwa, Naum (MS 2022) Analytical Chemist, Advanced Testing Laboratory, St Louis, MO.
- Meyer, Manuel (MS 2022), Associate Innovation Scientist, Sensient Pharma N. America, St. Louis, MO.
- Moore, Katelyn (BS 2018), Scientist Team Leader and Metal Analyst II, Pace Analytical Services, Hazelwood, MO.
- Morton, Kayla (BS 2011), Senior Group Leader, Eurofins Biopharma Product Testing, Columbia, MO.
- Neuschwander, Gretchen (BS 2022), Bench Scientist, Pfizer, St. Louis, MO, area.
- Nguyen, Trieu (BS 2022), pursuing master's degree at Missouri State University, Springfield, MO.
- Osswald, Heather (BS 2012), Principal Scientist, DeepCure, San Diego, CA.
- Phillips, Sarah (BS 2009, MS 2011), Senior Research Scientist, Biodesix, Inc. De Soto, KS.
- Sifers, Corrie (BS 2005), Senior Research Associate, Omeros Corporation, Seattle, WA.
- Tague, Eric (BS 2012, MS 2013), Software Development Manager, Thermo Fisher Scientific, Chicago, IL, area.
- Trammell (Freese), Allison (BS 2018, MS 2019), Clinical Laboratory Scientist Coordinator, Eurofins Viracor Biopharma Services, Lenexa, KS.
- Turner, Cody (MS 2020), Scientist II, Thermo Fisher Scientific, St. Louis, MO, area.
- West, Bryttani (BS 2018), Air Pollution Scientist, Colorado Department of Public Health and Environment, Cherry Creek, CO.
- Westwood, Megan (BS 2019, MS 2022), pursuing Ph. D Degree.
- Yarbrough, Melissa (BS 2011, BS 2012), Senior Manager, Digital Programs, Pharmaceuticals R & D, Pfizer, St Louis, MO.

2022 ALUMNI SPOTLIGHT



Dr. Lane Baker

Congratulations to the Chemistry and Biochemistry Department alumnus, Dr. Lane Baker (BS 1996), who was selected by the Society for Electroanalytical Chemistry to receive the 2023 Charles N. Reilley Award in Electroanalytical Chemistry in recognition of significant contributions to the discipline. Dr. Baker is also a Fellow of the American Chemical Society and the Royal Society of Chemistry. His previous awards include a CAREER Award from the National Science Foundation, a Cottrell Scholar's Award from the Research Corporation for Scientific Advancement, the Young Investigator Award from the Society for Electroanalytical Chemistry (SEAC), the American Chemical Society Division of Analytical Chemistry Award in Electrochemistry, and a special creativity award from the National Science Foundation. Dr. Baker served as Chair for the Division of Analytical Chemistry of the American Chemical Society in 2019. Other previous recipients of this award include Allen Bard (1984), Robert Osteryoung (1987), Royce Murray (1988), Adam Heller (2004), Charles Martin (2009), Richard van Duyn (2011), Joseph Wang (2019), and Shelley Minter (2020).

Baker received his bachelor's degree in chemistry from Missouri State University in 1996. After earning his doctorate at Texas A&M, he completed two postdoctoral appointments — a National Research Council Postdoctoral Associateship studying scanned probe microscopies with Lloyd J. Whitman at the Naval Research Laboratory in Washington, DC (2001-2004), followed by a subsequent appointment studying nanopore membranes and single nanopore platforms with Charles R. Martin at the University of Florida (2004-2006) — prior to beginning his independent academic career at Indiana in 2006. He had been the James F. Jackson Professor of Chemistry in the Indiana Department of Chemistry since 2014. Dr. Baker is currently the inaugural holder of the Dr. Carl D. McAfee Endowed Chair in Analytical Chemistry at Texas A&M. His research focuses on nanoscale electrochemical methods for analysis and imaging, with specific emphasis on new routes to high-throughput electrochemical analysis useful in studying phenomena at biological interfaces as well as both materials and environmental science.

GIVING

Missouri State University cannot operate without generous contributions from alumni and friends. Your support enables us to provide scholarships, teaching equipment, and more. We hope you will consider making a contribution; your gift is tax deductible. If you would like to contribute, please make checks payable to the MSU Foundation in support of Chemistry, and mail to: Temple Hall 423, 901 S. National Ave., Springfield, MO 65897. Or, you can donate online using link below and follow the prompts to enter any details.

<https://webapps.missouristate.edu/giving/pledgesearch.aspx?search=chemistry%20dept-general>

Thank you!

CHEMISTRY BOARD OF ADVISORS OFFICERS 2022

- Chair – Eric Roberts (moving from Vice-Chair to Chair)
- Vice-Chair – Mike Ebers
- Harold Boone
- Brad Bledsoe
- Tracy Clark-Stovall
- Wyman Grindstaff
- Matthew Harthcock
- Mike Minor
- David Osborne
- Joe Peters
- Corrie Sifers
- Jason Walworth
- Annette Wardell

A special thanks to Adam Wanekaya, Jessica Quin, and Chemistry Staff for their contributions to this issue of *Molecules and Moles*, the Chemistry and Biochemistry Department's Newsletter at Missouri State University.

Missouri State University adheres to a strict nondiscrimination policy and does not discriminate on the basis of race, color, religion, sex, national origin, ancestry, age, disability or veteran status in any program or activity offered or sponsored by the University. Prohibited sex discrimination encompasses sexual harassment, which includes sexual violence. In addition, the University does not discriminate on any basis (including, but not limited to, political and sexual orientation) not related to the applicable educational requirements for students or the applicable job requirements for employees. This policy shall not be interpreted in a manner as to violate the legal rights of religious organizations or military organizations associated with the Armed Forces of the United States of America. Missouri State University is an equal opportunity/affirmative action institution. Questions concerning compliance with regulations may be directed to the Office for Institutional Equity and Compliance, 901 South National Avenue, Springfield, Missouri 65897, Equity@MissouriState.edu, 417-836-4252, or to the Office for Civil Rights. 417-836-4252.

