Molecules and Moles

Chemistry and Biochemistry Department Newsletter: 2023

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. 2023 was another year of remarkable achievements by our students, faculty, and staff. Twenty-five students graduated with a bachelor's degree and nine graduated with a master's degree. Another 17 students were awarded the Foundations of Pharmaceutical Science Certificate. This translates to a total of 51 completions for the 2023 calendar year.

Our students have been very successful in securing internships at various industries and organizations and many of them secured permanent positions afterwards. The department takes pride in providing our students with not just technical and scientific training, but also with professional development opportunities. Maximo Reyes was awarded the Undergraduate Award in Environmental Chemistry by the American Chemical Society. Maximo worked in Dr Cyren Rico's lab where he investigated the effects of engineered nanoparticles, nanoplastics, and the fluorinated compounds of widespread soil contaminants on plants. He started his Ph.D. program at the University of Georgia in Fall 2023. Graduate student Preston Clubb won first place in the Sustainable Nanotechnology Organization's NanoPitch contest in Fall 2023. NanoPitch is a contest in which students pitch problems or opportunities connected with their sustainable nanotechnology research and provide solutions in a clear and compelling manner in 100 seconds.

IN THIS ISSUE:

Personnel movements and changes are always newsworthy, and this year is no exception. Dr. Santimukul Santra joined our faculty as Professor of Organic Chemistry in Fall 2023. He graduated with a Ph.D. from the Indian Institute of Technology and was previously at Pittsburg State University. Welcome Santi! We congratulate Dr. Cyren Rico for being promoted to Associate Professor (with tenure) and Dr. Gary Meints for promotion to Full Professor. On the other hand, Dr. Eric Bosch and Dr. Richard Biagioni both retired in 2023 after decades of excellent performance at Missouri State. We wish them all the best in their emeritus status!

Continued on Page 2

Dr. Nathan Schultheiss (BS 2001, MS 2003), Dr. Mary Krause (BS 2005, MS 2005), and Geoffrey Manani (MS 2014) joined the Chemistry and Biochemistry Department Board of Advisors. Nathan is currently the Director of Unconventional Energy at Purdue University. Mary is the Director of Formulation Development at Bristol Myers Squibb, and Geofrey is the Lead Chemist at Rhomar Water Management. Welcome aboard, and thanks for agreeing to serve!

In closing, we thank our alumni and friends for their continued support. We look forward to strengthening these relationships. I hope 2024 will be prosperous to you, both personally and professionally.

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

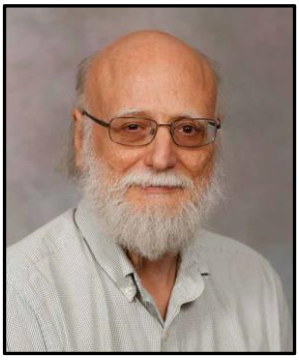
WELCOME NEW FACULTY AND STAFF

Introducing Dr. Santimukul Santra, Professor of Chemistry

Dr. Santimukul Santra was born in the district of Midnapur, West Bengal, India, in a small family with mixed culture of chemical and agricultural sciences. He completed his undergraduate (BS) and Master of Science (MS) degrees in Organic Chemistry from reputed institutions in India. His interest in organic synthesis motivated him for higher study. He joined the department of chemistry at the Indian Institute of Technology-Bombay (IIT-B) for pursuing doctoral degree. At IIT-B, his research was focused on stepwise organic synthesis of biologically active small molecules and dendritic macromolecules for drug delivery. During this time in Dr. Kumar's lab, he got his hands into the multistep organic reaction methodologies and characterization techniques. Dr. Santra swiftly transitioned to Dr. J. M. Perez's lab at the Nanoscience Technology Center, University of Central Florida (UCF), Orlando, Florida, where he started as a postdoctoral research associate and worked in the area of nanomedicine and nanosensors. Later, he continued at UCF as a Research Assistant Professor. In Fall 2013, Dr. Santra joined Pittsburg State University, Pittsburg, Kansas as an Assistant Professor of Chemistry and subsequently promoted to the rank of Associate Professor in Fall 2018. Dr. Santra's lab moved to the Department of Chemistry and Biochemistry at Missouri State University, Springfield, Missouri in Fall 2023, where he joined as a Professor of Organic Chemistry.

Currently, his research group focuses on developing personalized nanomedicines for cancer therapy, redox-active nanosensors for the detection of infectious diseases and exploring polymer-supported recyclable catalysts. His lab received over $2 M of extramural research funding at the Federal level. At MSU, his group will continue to work on his current NIH and ACS-PRF funded projects, exploring in the area of targeted drug delivery, fusion interactions of enveloped viruses, and recyclable catalysts. Dr. Santra has a strong passion for interactive teaching with over 10 years of classroom teaching experience with general chemistry and organic chemistry courses. At MSU, he will continue to teach organic chemistry courses. Beyond the classroom teaching and active lab research, Dr. Santra likes international travel and experiencing diverse cultures from different continents.

GENERAL ANNOUNCEMENTS



Richard Biagioni
Retiring in 2023

Eric Bosch
Retired in 2023

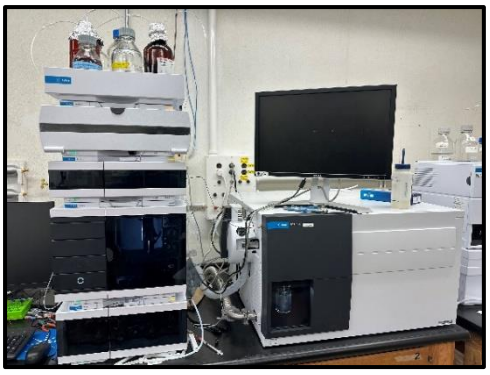
CNAS Faculty Awards Winners:

Tuhina Banerjee - Teaching

CNAS Dean Fellows:

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

FACILITIES UPDATES – NEW INSTRUMENTS

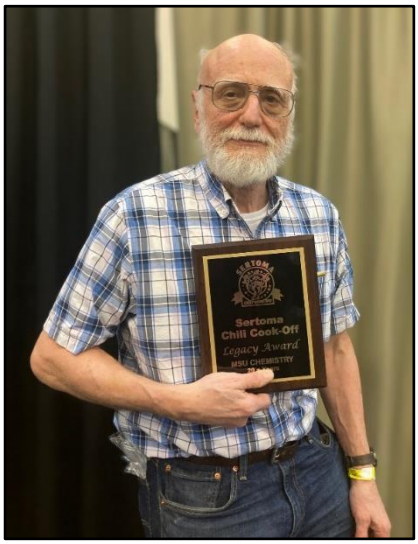


New LC-MS
Agilent 6470 Triple Quadrupole Liquid Chromatography – Mass Spectrometer (LC-MS) Instrument

FACULTY / STAFF ACCOMPLISHMENTS

January 1 – December 31, 2023

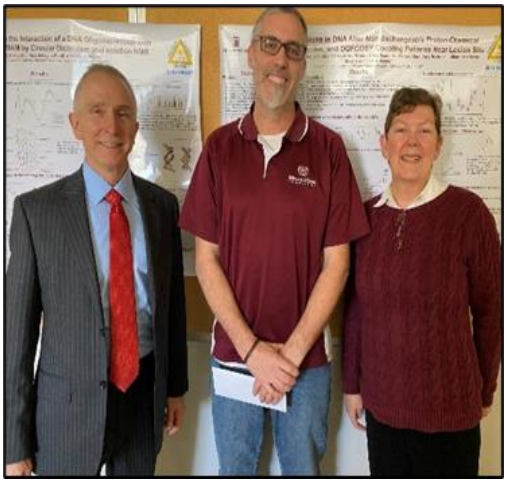
Congratulations on these Fine Achievements!



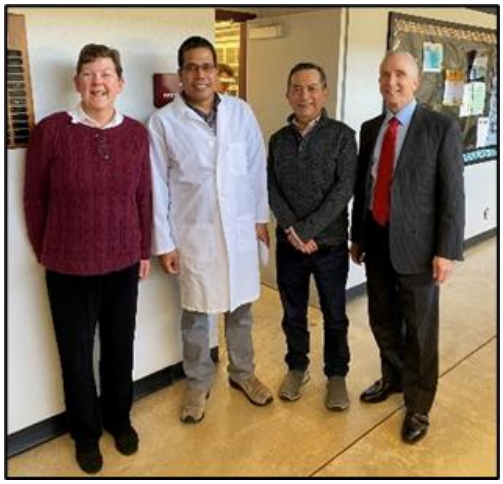
Dr. **Richard Biagioni** was awarded a Legacy plaque for 20+ years of hosting the Toxic Chili booth at the 2023 Sertoma Chili Cook-Off!

Biochemistry Assistant Professor **Tuhina Banerjee** received a $250,000 National Science Foundation grant for her proposal entitled, "Light Tunable Redox-Active Hybrid Nanomaterial with Ultrahigh Catalytic Activity for Colorimetric Applications."

"This grant will enable me to diversity my lab workforce, recruit more students, and give them the opportunities they deserve," Dr. Banerjee said.



Gary Meints (center)
Promoted to Full Professor, Aug. 2023
(also shown: left, Provost John Jasinski; right Dr. Tamera Jahnke, Dean, CNAS)



Cyren Rico (white lab coat)
Promoted to Assoc. Prof. with Tenure, Aug. 2023
(also shown, from left: Dr. Tamera Jahnke, Cyren, Dr. Jorge Rebaza-Vasquez, Provost John Jasinski)

FACULTY / STAFF ACCOMPLISHMENTS – Continued

Dr. Tuhina Banerjee received the CNAS Faculty Excellence in Teaching Award for 2023!

Dr. Banerjee, Assistant **P**rofessor of Chemistry & Biochemistry**,** typically teaches Introductory to Biochemistry classes/labs, Biochemistry I and Advanced Topics in Biochemistry. She has a very strong passion for teaching and creating a hands-on learning experience for her students. She focuses on creating a welcoming environment that encourages student questions. She greatly enjoys sharing her love for teaching and research with her students, inspiring them to dive deep into their studies!

Additionally, Dr. Banerjee introduced inquiry-based teaching/labs, clinical-based questions, and other innovative teaching techniques, including interactive mentoring sessions. She introduced students to cutting-edge concepts of protein folding/misfolding along with clinical correlations. In other classes, Dr. Banerjee incorporated case studies to correlate lecture content and clinical applications. Additionally, she used the concept of flipped classrooms and combined them with collaborative student presentations.

Dr. Banerjee also used fun activities like the "Rap Battles" which amplified the learning of core biochemistry concepts by being more interactive. "I absolutely love this event as it gives an opportunity for students from diverse backgrounds and majors to interact and work on core concepts of biochemistry in a fun-filled way, After the event, most students formed study groups, so it's very rewarding for me to see their success." – Dr. Banerjee

INTELLECTUAL CONTRIBUTIONS

January 1 – December 31, 2023

Banerjee, Tuhina (Assistant Professor)

Refereed Journal Articles

Journal Article, Professional Journal (Published)

Bader., C., Taylor, M., Banerjee, T., Teter, B. (2023). The cytopathic activity of cholera toxin requires a threshold quantity of cytosolic toxin. Cellular Signaling. 2023, 101,110520.

Journal Article, Professional Journal (Published)

Banerjee, T., Panchal, N., Sutton, C., Elliott, R., Patel, T., Kajal, K., Arogunye. E., Koti, N., Santra, S. (2023).Tunable Magneto-Plasmonic Nanosensor for Sensitive Detection of Foodborne Pathogens. Biosensors, 2023, 13, 109.

Bosch, Eric (Emeritus)

Refereed Journal Articles

Journal Article, Professional Journal (Published)

Rammer, M. L., Gonnering, E. R., Driscoll, Z. L., Vang, H. G., Bosch, E., Bowling, N. P. (2023). Molecular Turnstiles Featuring Bicyclic Rotators; Solution and Solid-State Investigation of Steric and Electronic Concerns. *Chemistry: A European Journal, 26*, e202300716 (1 of 7).

Journal Article, Professional Journal (Published)

Bosch, E., Reinheimer, E. W., Unruh, D. K., Groeneman, R. H. (2023). Co-crystal sustained by pi-type halogen-bonding interactions between 1,4-diiodoperchlorobenzene and naphthalene. *Acta Cryst E. Crystallographic Communications, E79*, 958-961.

Journal Article, Professional Journal (Published)

Powell, C. J., Bosch, E., Krueger, Jr., H. R., Groeneman, R. H. (2023). Preference of halogen bonds over hydrogen bonds within a discrete three-component co-crystal that undergo a [2 + 2] cycloaddition reaction. *New Journal of Chemistry, 47*, 13084-13087.

Continued…

Journal Article, Professional Journal (Published)

Grinde, N. H., Kehoe, Z. R., Vang, H. G., Mancheski, L. J., Bosch, E., Southern, S. A., Bryce, D. L., Bowling, N. P. (2023). Rapid Access to Encapsulated Molecular Rotors via Coordination-Driven Macrocycle Formation. *Chemistry: A European Journal, 2023*, e202301745.

Journal Article, Professional Journal (Published)

Bosch, E., Powell, C. J., Krueger, Jr, H. R., Groeneman, R. H. (2023). Photoreactive Polymorphic Cocrystals Utilizing a Molecular Template with Dual Halogen and Hydrogen Bonding Capabilities. *Crystal Growth and Design, 23*(6), 3947-3951.

Journal Article, Professional Journal (Published)

Bosch, E., Moreno, B. S., Bowling, N. P. (2023). Pi-Complexation and Nonconventional C-H Hydrogen Bonding in the Formation of Coloured Cocrystals. *Acta Crystallographica, C: Structural Chemistry, C79*, 149-157.

Journal Article, Professional Journal (Published)

Bosch, E., Unruh, D. K., Santana, C. L., Groeneman, R. H. (2023). Halogen-bonded co-crystal containing 1,3-diiodo-perchlorobenzene and the photoproduct rtct-tetra-kis-(pyridin-4-yl) cyclobutane resulting in a zigzag topology. *Acta Crystallographica Section E, 79*(3 (March 2023)), 212-215.

Journal Article, Professional Journal (Submitted)

Bosch, E., Speetzen, E., Bowling, N. P. Halogen bonded supramolecular parallelograms: From self-complementary iodoalkyne halogen bonded dimers to 1:1 and 2:2 iodoalkyne halogen bonded cocrystals. *Crystal Growth and Design, 2023*.

Gerasimchuk, Nikolay N. (Distinguished Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. Synthesis and Characterization of Iron(II) Schiff-Base Complexes of Tridentate Mixed Amine/Imine Ligands with cis- and trans-1,2-Diaminocyclohexane Backbones.. *Polyhedron, 2023*(246), 116669.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N., Meadows, M. (2023). Synthesis and Characterization of Pt(II) and Pd(II) Complexes with Planar Aromatic Oximes.. *Inorganics, 2023*(11, 116).

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2023). NaGaSe2: A Water-Loving Multifunctional Non-van der Waals Layered Selenogallate. *Inorganic Chemistry, 2023, 62*(9), 3886-3895.

Other Intellectual Contributions

Scientific presentation (Accepted)

Gerasimchuk, N. N. *Current status of Pt-based 1D solids.* Baltimore, MD:.

Scientific presentation at Midsouth Inorganic Association Spring 2023 Meeting. (Accepted)

Gerasimchuk, N. N., Adedamola, A. O. *REMARKABLE STRUCTURAL DIVERSITY OF N-PYRROLIDINE-CYANOXIME AND ITS METAL COMPLEXES* . Beebe, AR.

Jahnke, Tamera (Full Professor)

Book Chapters

Book, Chapter in Scholarly Book-New (Accepted)

Hornberger, R. S., Jahnke, T. *SEM in action*.

Rico, Cyren (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Rico, C., Wagner, D., Ofoegbu, P., Kirwa, N., Clubb, P., Coates, K., Zenobio, J., Adeleye, A. (2023). Toxicity assessment of perfluorooctanesulfonic acid (PFOS) on a spontaneous plant, velvetleaf (Abutilon theophrasti), via metabolomics. *Elsevier, 907*, 13.

Journal Article, Academic Journal (Published)

Ayub, M. A., Zia ur Rehman, M., Ahmad, H. R., Fox, J. P., Clubb, P., Wright, A. L., Anwar ul Haq, M., Nadeem, M., Rico, C., Rossi, L. (2023). Influence of ionic cerium and cerium oxide nanoparticles on Zea mays seedlings grown with and without cadmium. *Environmental Pollution, 322*, 121137.

Continued…

Journal Article, Academic Journal (Published)

Ayub, M. A., Zia ur Rehman, M., Ahmad, H. R., Rico, C., Abbasi, G. H., Umar, W., Wright, A. L., Nadeem, M., Fox, J. P., Rossi, L. (2023). Divergent effects of cerium oxide nanoparticles alone and in combination with cadmium on nutrient acquisition and the growth of maize (Zea mays). *Frontiers in Plant Science, 14*, 1151786.

Journal Article, Academic Journal (Published)

Hong, J., Jia, S., Wei, L., Wu, M., Chen, F., He, F., Ogundele, O. R., Rico, C. (2023). Changes in physiological profiles and co-occurrence patterns of soil microbial community following exposure to nanoceria and ionic cerium. *Environmental Science: Nano*.

Journal Article, Academic Journal (Published)

Wang, L., Chen, C., He, R., Rico, C., Mao, Q., Sun, P. (2023). Tree age and maturity stage affect reducing sugars, organic acids and minerals in Ziziphus jujuba Mill. cv. Huping fruits. *115*, 105007.

Wang, Fei (Associate Professor)

Refereed Journal Articles

Journal Article, Professional Journal (Published)

Buxi, K., Mondal, A., Wang, F., Jana, P. P. (2023). Structural and theoretical investigations on the “coloring” scheme of γ-brass type phase Ag5Cd8. *Journal of Solid State Chemistry, 323*, 124019.

Journal Article, Academic Journal (Published)

Lakshan, A., Buxi, K., Dutta, A., Wang, F., Jana, P. P. (2023). Cu4TiTe4: Synthesis, Crystal Structure, and Chemical Bonding. *Inorganic Chemistry, 62*(2), 748-755.

Yoshimatsu, Keiichi (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Koide, H., Saito, K., Yoshimatsu, K., Chou, B., Hoshino, Y., Yonezawa, S., Oku, N., Asai, T., Shea, K. J. (2023). Cooling-induced, localized release of cytotoxic peptides from engineered polymer nanoparticles in living mice for cancer therapy. *Journal of Controlled Release, 355*, 745-759.

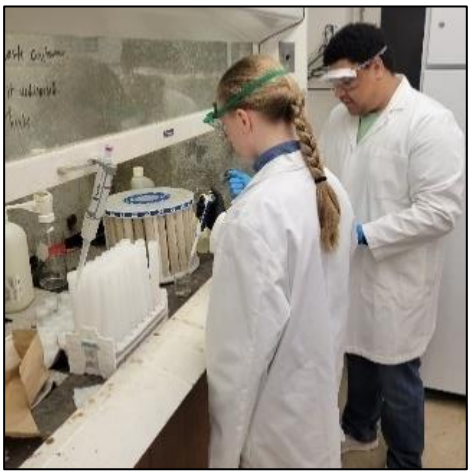
STUDENT ACCOMPLISHMENTS

Maximo Reyes Receives ACS Undergraduate Award in Environmental Chemistry

Maximo studied the effects of engineered nanoparticles, nanoplastics, and fluorinated compounds on plants. He performed ICP-MS and biochemical analyses of plants and soil/sediments in collaborative projects with researchers from the University of Nebraska, Pittsburg State University, and Mindoro State University (Philippines).

Maximo presented several posters and gave one oral presentation at the AAAS 2023 Emerging Researchers National Conference in STEM. He also assisted in STEM outreach and ACS Coach Program with Willard High School students. He is currently co-writing a manuscript for publication.

Max will soon join the PhD program at the University of Georgia to continue his scientific career.



(at right, Maximo in lab [top], and presenting at the MSU MOLSAMP [bottom])

Preston Clubb Presents at NanoPitch

(Preston makes his presentation)

The NanoPitch Contest is held every year at the Sustainable Nanotechnology Organization (SNO) Conference during their Gala Dinner. Students are invited to pitch a problem or opportunity connected with their sustainable nanotechnology research in a clear, compelling manner in 100 seconds. Similar to the 3MT, students have only one PowerPoint slide to address their problem, proposed solutions and potential impacts of their research. Preston Clubb participated in the NanoPitch with his pitch titled, "Stress memory of parental exposure to cerium oxide nanoparticles on responses of progeny plants exposed to perfluorooctanesulfonic acid." While there were a dozen student participants from R1 Doctoral Institutions, Clubb won the contest, bringing home the first-place award and $300. Clubb says that the NanoPitch has taught him to be concise and persuasive of his research and stimulate good performance under pressure.

STUDENT ACCOMPLISHMENTS - continued

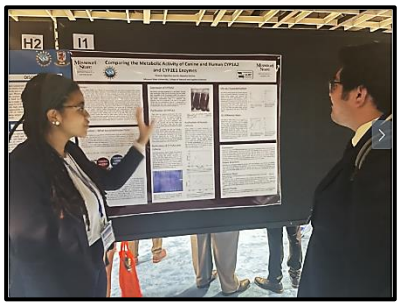
Outstanding Senior – Tanner Rust

Tanner Rust

I would like to add my favorite memories of every staff and faculty member in the department:

- Allen - Her VERY impressive wall(s) of postcards and giving me a reason to keep a lookout for them on vacation.
- Banerjee - Getting to watch the rap battles of her biochemistry students.
- Bhattacharyya - Sharing stories and catching his very contagious laughter.
- Biagioni - Daring to say the M word in Instrumental Analysis.
- Breyfogle - "When I had you in 171, I didn't think you were very bright, but it looks like you are a superstar now" (Breyfogle, after learning that I got this award.)
- Bosch - Always pestering him to give me a ride in his Tesla.
- Curtis – Never ceases to sneak in a Pokémon reference.
- DeVore – Entertaining my pre-class banter in Prep for Grad Studies.
- G - Sponsoring my haircut and providing delicious bread.
- High - "When it comes to the exam, you'll either ride the train or get hit by the train." (High, convincing CHM 160 students to study)
- Meints - The phenomenal 'roast' session that I was a 'victim' of at the 2022-2023 banquet.
- Metzker - Have not met formally but enjoyed her presentation using VR to demonstrate lab layout.
- Quin - Never knowing if her airpod is going to be in her left ear or right ear.
- Richter - Have not met formally but seeing him leave Temple/Blunt with a ball cap and sunglasses makes him seem like a celebrity in disguise.
- Rico - Entertaining my pre-class banter in Chemical Symposium.
- Schick - Seeing (via webcam) his sword collection on his wall during COVID.
- Sedaghat-Herati - Reassuring me that the exam will not be hard in response to my question in every Organic I and II class, "Will this exam be hard?"
- Siebert - Hearing the stories of his hiking quest to summit half dome.
- Steinle - Him wincing at my calculator that at some point I spilled acetone on (and still used in Analytical Chemistry), to which he said, "Man, that thing has seen war."
- Wanekaya - Discussing what sounds good for dinner during the 5:30-9:30 p.m. analytical lab.
- Wang - Always excitedly greeting each other, even though we have not had a conversation longer than a couple sentences.
- Yoshimatsu - The moment I realized that I managed a 25/25 on a Yoshimatsu-graded seminar summary, with the feedback, "It was well written!"

Congratulations, Tanner!



Victoria presenting her poster

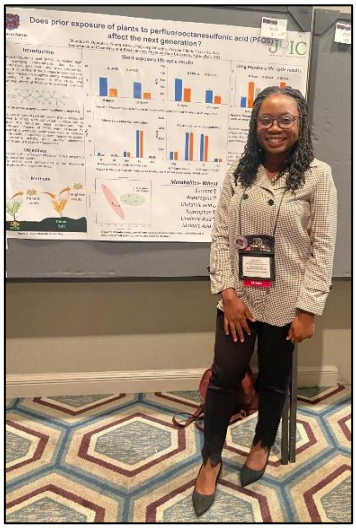
Maximo, Victoria, Dr. Tayo, Ana, Maddi

Dr. Tayo, Maximo, Ana, Maddi, Victoria

Three **CNAS Students of Color** presented at Emerging Researchers Conference in Washington DC!
Three of our LSAMP students won travel awards to participate in the ERN conference in DC (2/9-2/11) and presented their research in DC.
Victoria Ogbeifun (DeVore), **Maximo Reyes** (Rico), and **Ana Torres** (Moreno & Obafemi-Ajayi).
One of our first-year scholars (**Madi Mickle**) was also there to observe and learn.
Thank you, Dr. Tayo Obafemi-Ajayi, for taking the lead on the MoLSAMP project and leading these students!

STUDENT ACCOMPLISHMENTS - continued

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

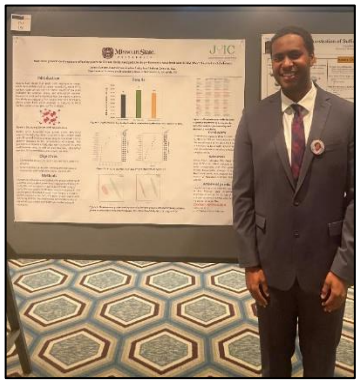


NOBCChE's 50th Annual Conference. Sept 11-14, 2023, at New Orleans.

I am honored to have been accepted to present my research at NOBCChE for the second time. Additionally, I was awarded the Advancing Science Student Grant again. Overall, it was a great conference filled with so much networking and informative sessions.

Josh Garland attended the Conference with me.

- Olamide



(pictured at right, top: Olamide Ogundele;

bottom: Joshua Garland)

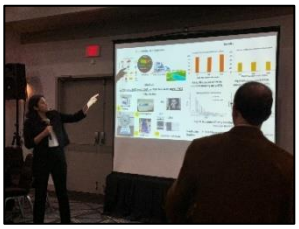
Delta Corteva Agriscience Symposium, August 1-3, 2023 – Indianapolis, Indiana

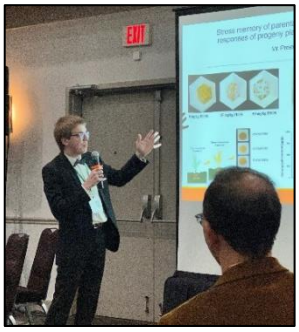
I am honored to have been chosen as one of the 40 students nationwide for this symposium. During the event, I presented a poster and had the privilege of networking with top management. The CEO's 15-minute speech in person was a remarkable experience. The informative discussions and the overall comfort at the event were noteworthy. Subsequently, I received internship offers from three different departments: Biotechnology, Crop Protection and Development, and Regulatory and Stewardship. I am in the process of deciding which department aligns best with my interests.

(at left, Olamide at the Corteva Symposium)

STUDENT ACCOMPLISHMENTS - continued

Masters Students Present at the Sustainable Nanotechnology Organization Conference (SNO)





The 12th Sustainable Nanotechnology Organization (SNO) Conference was held in Los Angeles, California this past month where roughly 120 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. Preston Clubb, Iqra Shakoor, and Jake Churchman – all from Dr. Cyren Rico's lab – were invited to present their research.

Clubb presented on "Metabolomics reveals immense changes to daughter plants when exposed to perfluorooctansulfonic acid when previously exposed to nano-ceria."

Shakoor and Churchman both presented posters titled, "Perfluorooctanesulfonic Acid Adsorption on Cerium Oxide and Magnesium Oxide Nanoparticles" and "Co-exposure of Scallions (Allium fistulosum) to Cerium Oxide Nanoparticles and Perfluorooctanesulfonic Acid," respectively.

This year, the conference included many seminars discussing the 2023 Nobel Prize in Chemistry, functionalizing nanomaterials with heteroatom titanates and zirconates, and even nano-scale hybrid materials for a new circular carbon economy and clean energy transitions. Along with other talks from prominent people in the profession, there was a tribute session for Dr. Jorge Gardea-Torresdey, Dr. Cyren Rico's advisor from when he did his PhD.

All three of Dr. Rico's students had the opportunity to meet Dr. Gardea-Torresdey, but they had one question to ask him: "Did Dr. Rico *really* have the most publications from your lab?" In agreement with other colleagues that worked with Dr. Rico, they said he published over 15 peer-reviewed articles from his time under Dr. Gardea-Torresdey. Clubb hopes to set his own record in Dr. Rico's lab; he already has four peer-reviewed articles and is on track to have seven by the time he graduates next semester.

The conference also recognizes outstanding students and their contributions to the field. Shakoor received the SNO Student Award (which Clubb received last year), and Churchman received the SNO grant. Shakoor and Churchman are beyond thankful for the support that SNO has provided so they may attend this year's conference. Additionally, Clubb received the SNO grant and won the SNO NanoPitch Competition, taking home the First-Place prize worth $300.

While they all brought home the bacon, they said that networking was important for them at this conference, not just the awards. They said, "who knows you" is more important than "who you know." Creating these connections opens doors to dialogues, which in turn open doors to opportunities. In addition to establishing connections, it's critical to invest effort in maintaining them because they may prove useful in unforeseen circumstances in the future. From this, Clubb has already received an offer from UCLA to join them next year; he hopes that Shakoor and Churchman will get one soon.

STUDENT ACCOMPLISHMENTS - continued

Symposium Winners 2023

Chemistry and Biochemistry

1st Place: Maximo Reyes, Jessica Linson, Preston Clubb, Martin Winburn, Barry Cheung.
Effects of Atmospheric Plasma Treatment on the Toxicity of Polystyrene Nanoplastics in Wheat (Triticum Aestivum L.)
Faculty Advisor: Dr. Cyren Rico

2nd Place: Krusha Bhakta
Studies of Backbone Interconversion and Dynamic Properties in DNA via NMR
Faculty Advisor: Dr. Gary Meints

2023 -CNAS 3-Minute Theses Winner

Iqra Shakoor, CHM

29th Annual Graduate Einhellig Interdisciplinary Forum Winner

Outstanding Poster Presentations:

Alexander Babel, Jeffery Darko, Elson Eguasoa, Olamide Ogundele, and Dhruv Sitapara

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American Chemical Society Officers 2023

President: Brooke Winder
Vice President: Trishna Timalsena
Secretary: Aaron Autry
Treasurer: Joe Truong

2023 SCHOLARSHIP AND AWARD WINNERS

Chemistry Dept. Scholarship Fund	Zach McCubbins
Chemistry Dept. Graduate Scholarship	Olamide Ogundele
Chemistry Board of Adv. Summer Research Fellowship	Kristos Baffour, Tanner Rust, Iqra Shakoor
Doris C. Lorz Scholarship	Maddie Ellis, Victoria Ogbeifun, Riley Pope
Dr. & Mrs. Vernon Thielmann Chem. Education and Chemistry Undergraduate Research Award	No Applicants
Dr. Robert W. Martin Research Fellowship	Grace Atkins
Emil Lorz Memorial Scholarship	Olga Demicheva
Eugene T. Scafe Memorial Scholarship	Renewal: Calysta Nichols; New: Samantha Ball, Victoria Ogbeifun, Riley Pope, Tanner Rust, Joe Truong
Harriett H. Ford Memorial Scholarship	Emilee Dees
Harthcock Chemistry Research Fellowship	Alexander Babel, Autumn Pilarski
Louise & Roland Harthcock Scholarship	Olga Demicheva, Theodora Osborne, and Logan Osterman
Robert Lloyd Ernst Summer Graduate Assistantship	Dhruv Sitapara
Robert S. Christie Memorial Scholarship	Kristos Baffour, Preston Clubb, Olamide Ogundele, and Iqra Shakoor
WEB & AOB Memorial Scholarship	Preston Clubb
William J. Husa Chemistry Scholarship	Clinton Orori
Wyman & Sue Grindstaff Chem. Education Scholarship	N/A
Foundation for Immunotoxicology Award	Victoria Ogbeifun
ACS Organic Division Undergraduate Award	Tanner Rust
ACS Undergraduate Award in Inorganic Chemistry	Joe Truong
ACS Undergraduate Award in Analytical Chemistry	Abigail Teitelbaum
POLYED Undergraduate Organic Chemistry Award	Joe Truong
Outstanding Environmental Chemistry Student	Jessica Linson
General Chemistry Achievement Award	Morgan Lewis, Mackayla Deckert
Outstanding Physical Chemistry Student Award	Tanner Rust
Outstanding Biochemistry Student Award	Krusha Bhakta
Outstanding Inorganic Chemistry Student Award	Joe Truong
Outstanding Student in Instrumental Analysis	Tanner Rust
Outstanding Senior (Undergraduate Only)	Tanner Rust

Back row: Tanner Rust, Grace Atkins, Olamide Ogundele, Dhruv Sitapara, Victoria Ogbeifun, Riley Pope, Preston Clubb, Alex Babel, Kristos Baffour, Autumn Pilarski, Emilee Dees, Olga Demicheva, and Abigail Teitelbaum

Front row: Iqra Shakoor, Joe Truong, Morgan Lewis, Jessica Linson, Krusha Bhakta, and Maddie Ellis

2023 SCHOLARSHIP AND AWARD WINNERS

GRADUATES 2023

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

Spring 2023

Master's Degree
Matthew Anderson

Bachelor's Degree
Krusha Bhakta
Macy Davis
Shayd Gothard
Haylee Grannemann
Ethan Grier
Jonathan Ivanoff
Lydia Lang
Nickson Mbaro
Caitlin Padgett
Gannon Patterson
Linda Phan
Maximo Reyes
Tanner Rust
Naseem Saquer
August Schwoebel
Emma Taylor
Ashley Winder

Undergraduate Certificate
Morgan Griesemer
Hayden Hepler
Haley Huson
Morgan Jones
Kayla Kline
Avery Moeller
Haley Oetterer
Gannon Patterson
Claire Weber
Emily Wilson
Allison Winkler

Summer 2023

Master's Degree
Sarah Adeoye
Autumn Pilarski
Lauren Sayler
Dhruvkumar Sitapara

Bachelor's Degree
Ethan Barney-Stavrou
Jacob Linhardt
Jessica Linson

Undergraduate Certificate
Ethan Barney-Stavrou
Hannah Bunner

Fall 2023

Master's Degree
Elson Eguaosa
Zachary Flint
Olamide Ogundele

Bachelor's Degree
Grace Atkins
Taryn Criblez
Jessica Gilbert
Reese Potter
Lane Spillman

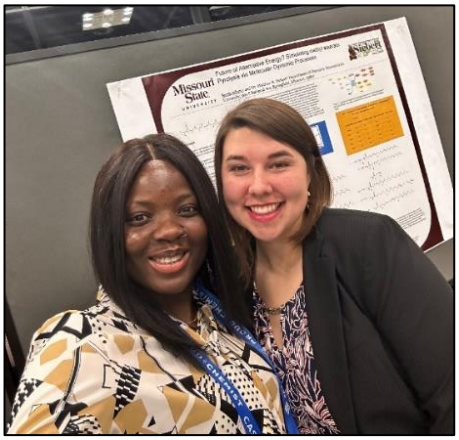
Undergraduate Certificate
Olivia Grieve
Jonathan Ivanoff
Cody Mulroy
Breanna Skinner

ACS NATIONAL MEETING - SPRING 2023

The National ACS Spring 2023 Meeting was held March 26-30, 2023, in Indianapolis, Indiana, at the Indiana Convention Center. The theme of this meeting is "Crossroads of Chemistry." The meeting will explore a variety of "crossroads" topics such as: where the field of chemistry has been, where we are now and where we are heading—in terms of scientific discovery, societal impact and diversity and inclusion in the practice of chemistry. Additional topics included: evolution of the field of chemistry as new connections are made between previously distinct fields within chemistry and between chemistry and other disciplines; and effective communication to connect the chemistry profession with the general public and with the next generation of budding scientists.

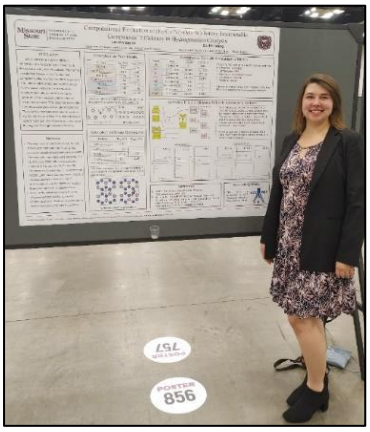
Here are some photos from the event!

Sarah Adeoye



Sarah Adeoye and Lauren Sayler

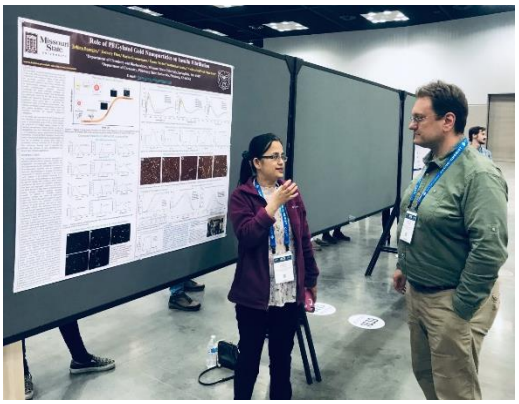
Sarah Adeoye



Lauren Sayler

Sarah Adeoye and Olamide Ogundele

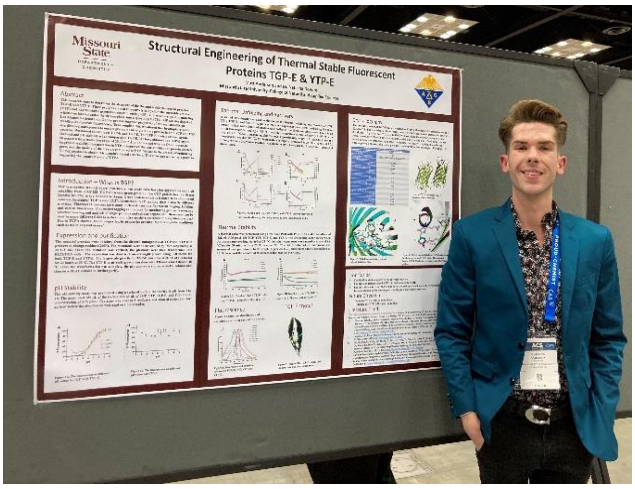
Matthew Anderson, Autumn Pilarski, Dr. Tuhina Banerjee, and Dhruv Sitapara



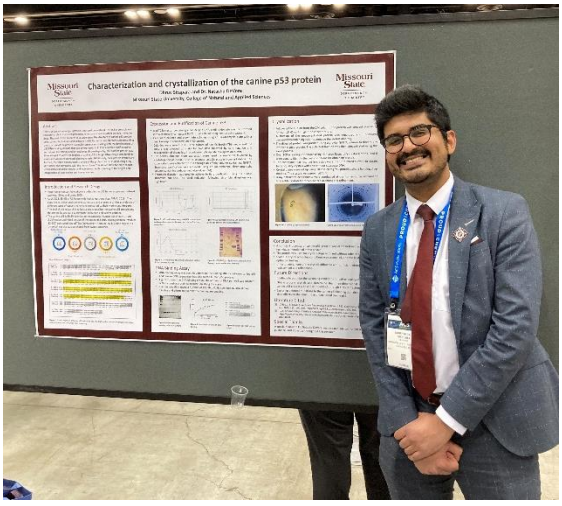
Dr. Tuhina Banerjee presenting her poster

ACS NATIONAL MEETING - SPRING 2023 Continued

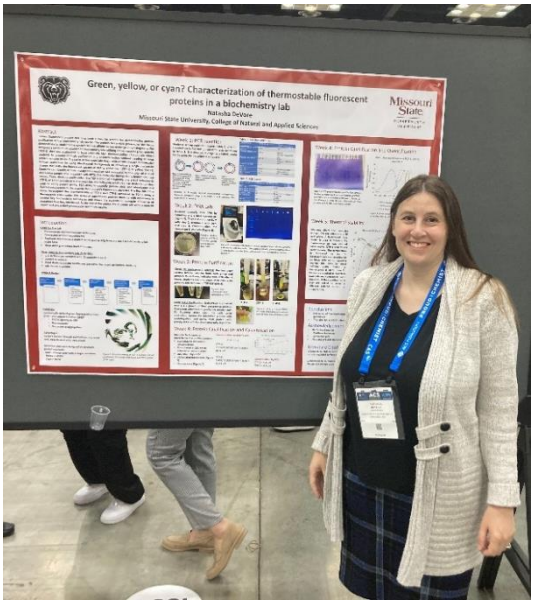
Autumn Pilarski



Matthew Anderson



Dhruv Sitapara

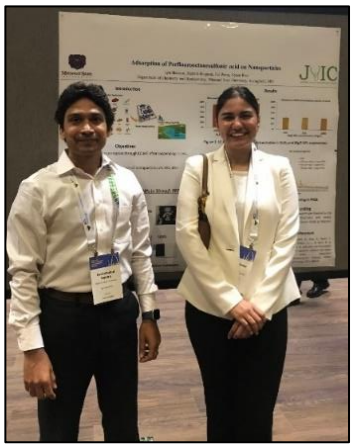


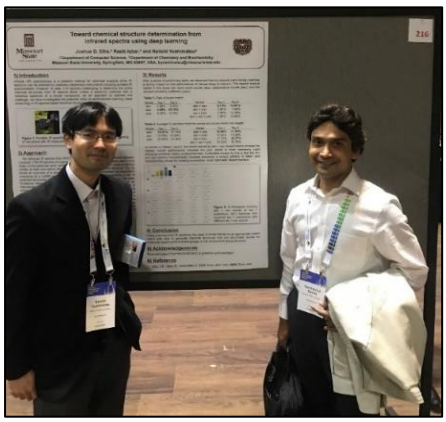
Dr. Natasha DeVore

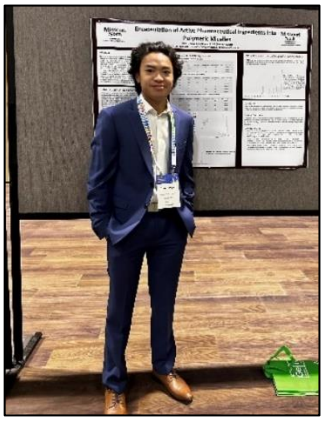
ACS MIDWEST REGIONAL MEETING – FALL 2023

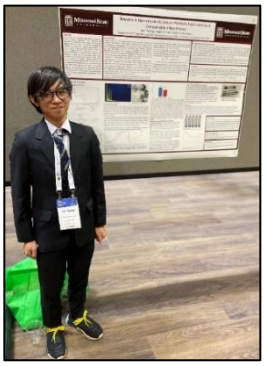
Numerous Chemistry Department students and faculty attended the 2023 ACS Joint Midwest-Great Lakes Regional Meeting held October 18-21, 2023, in St. Louis, Missouri, at the St. Charles Convention Center. Co-hosts for the meeting were the St. Louis and East Central Illinois Sections of the ACS. This year's theme was "Scale Up Your STEM" and provided MSU Chemistry Department's undergraduate and graduate students ample opportunity to present their research and make great contacts. The meeting feature plenary speakers, exciting technical sessions, special symposia, poster sessions, regional awards, social events, and a large vendor expo. In addition, there were special undergraduate programming, chemistry education workshops for high school teachers, and events sponsored by the local Younger Chemists Committees and the Minority Affairs Committees. It was a great opportunity for undergraduate and graduate students to present their research and get to know the Midwest and Great Lakes chemistry communities.

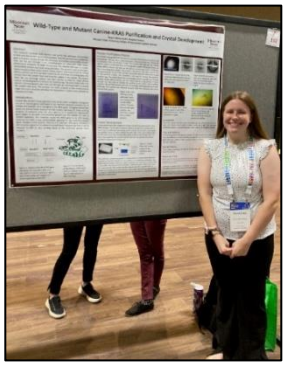
Here are some photos from the event!

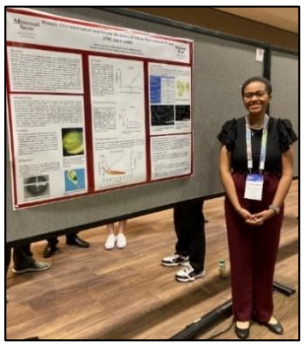

Dr. Santra and Iqra Shakoor

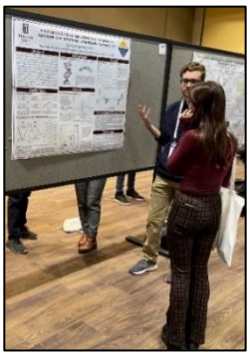

Dr. Yoshimatsu and Dr. Santra


Trieu Nguyen


Joe Truong


Taryn Criblez
Received a Poster Award


Victoria Ogbeifun

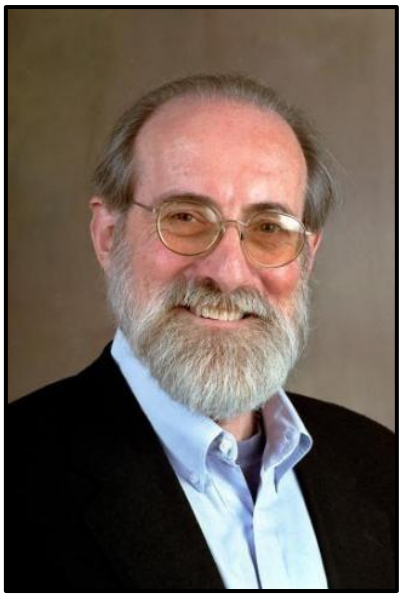

Collin Johnson

DR. SANTRA'S CHEMISTRY CLASS HAS FUN WITH HALLOWEEN!

The Team + The Plan x **The Creation = The Result!**

Dr. Santra's class partakes in some festive activities on Halloween!
During an in-lab activity of CHM 345: Microscale organic chemistry lab, students dressed up and carved a pumpkin. Lab was scheduled on the day of Halloween and students decided to incorporate some Halloween-related fun activities after the lab session is over.

MISSOURI STATE UNIVERSITY ALUMNI



Dr. Jerry L. Atwood Honored with 2023 ACS Award in Inorganic Chemistry

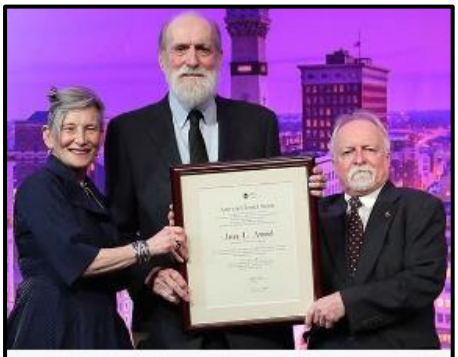
Dr. Jerry L. Atwood (left) (BS 1964) was recognized for his numerous important contributions to Inorganic Chemistry. He was honored with the 2023 ACS Award in Inorganic Chemistry: Symposium in Honor of Jerry L. Atwood, held March 26, 2023, at the Indiana Convention Center.

He is recognized for extending the transformative principles of inorganic chemistry to the disparate fields of separation science, supramolecular chemistry, and host-guest chemistry.

Born in Springfield, Missouri, Dr. Atwood graduated from Missouri State University (then Southwest Missouri State University) in 1964, and received his PhD from the University of Illinois in 1968. Dr. Atwood is Professor Emeritus from the University of Alabama; he retired from the University of Missouri as Curator Professor Emeritus, after serving as a Curators' Distinguished Professor in Chemistry.

He is the author of *Supramolecular Chemistry and Organic Nanostructures*, in addition to extensive editorial and professional contributions to prestigious chemistry and scientific journals and professional memberships. He became an international leader in the subject by developing the field through years of dedicated research focusing on Supramolecular, Inorganic, Materials, Solid-State, and Environmental subjects. Dr. Atwood's professional experience spanned over 50 years of teaching, study, and research, primarily in Missouri and Alabama, and a term as Visiting Professor at the University of Sussex in 1985. In addition to the 2023 ACS Award, he has received numerous other awards and honors throughout his distinguished career.

Acknowledging Jerry's impact, Dr. Tamera Jahnke said, "Jerry L. Atwood has made several important contributions to Inorganic Chemistry. In celebration of Jerry L. Atwood receiving the ACS Award in Inorganic Chemistry, presentations placing it in proper perspective summarized Jerry's most important contributions to Inorganic Chemistry, including his unique ability to present his work in a refined and well-written form. Lastly, the talk discussed Jerry's exceptional ability to inspire his students."



2023 Recipient Jerry L. Atwood (Center) is Presented with His Award by Judith Giordan, ACS President (Left) and Sponsor Representative Leonard M. Sidisky (Right)

MISSOURI STATE UNIVERSITY ALUMNI - continued

Kameron Coates

Kameron Coates Earns Chemical Education Award

Mr. Kameron Coates (BS 2020 MSU) has been a high school science teacher at Willard High School in Willard, Missouri, for four years, teaching physical science, biology, honors chemistry, and AP chemistry. Kameron earned a Bachelor's Degree in Chemistry, and a Bachelor's Degree in Chemistry Education (Unified) from Missouri State University in 2020. While teaching, he earned his Master's Degree in Chemistry in August 2023, from Ohio University. His research focused on PFAS detected in U.S. precipitation events.

Kameron's passion for teaching chemistry can be observed through the many after school programs he has coordinated. One of Kameron's primary goals as an educator is for high school students to get experience doing college-level research. His AP chemistry students participate in research as a part of the ACS Coaches Program with MSU. Most recently, sunfish were harvested from Springfield Lake, and analyzed for heavy metal contaminants by inductively coupled plasma mass-spectrometry. Select students independently work as research assistants with MSU chemistry professors in their research labs. Last year, Kameron founded Willard's first Science Olympiad program. In their first year, the Chemistry Lab team won first place in their regional competition and seventh place in the state competition.

Outside of teaching, Kameron enjoys watching his students compete in other extra-curricular activities such as sports, band, and more. His wife of five years is a pediatric occupational therapist. When free time allows, they enjoy camping and hiking in the Buffalo River National Park.

Congratulations, Kameron!

2023 ALUMNI SPOTLIGHT

JESSICA BRUER (BS 2019; MS 2020)

I was born and raised in St. Louis, MO and started at Missouri State in fall of 2016 as a chemistry major. After taking an interest in Pchem, I began undergraduate research with Dr. Schick to explore the rheological properties of a pharmaceutical excipient. I then graduated with my BS in Chemistry in spring of 2019. I continued on at Missouri State to receive a MS in Chemistry through the Accelerated Master's Program, performing thesis research with Dr. Schick to determine the particle size of polymeric micelles in thermothickening solutions used in the pharmaceutical industry. I graduated from the program in spring of 2020 after the initial Covid-19 outbreak, defending my thesis from home over Zoom. Since graduating, I have returned to Springfield to present at seminars, attend the CNAS Career Fairs, and speak in career classes. I enjoy keeping in touch with the department and connecting with students.

I currently work as an Application Scientist for Sensient Colors based out of St. Louis. Sensient Colors is a unit of Sensient Technologies Corporation, a leading global manufacturer of coloring, flavoring, and other specialty ingredients. As an Application Scientist I am responsible for the technical development of new and improved colorants for use across the food and beverage industry. This involves partnering with customers to solve their color challenges, bringing products to market, and utilizing my scientific knowledge to properly formulate and analyze products.

I first discovered Sensient Colors during my undergraduate study at Missouri State University where I interned for their regulatory department, responsible for overseeing FDA regulations on food ingredients. I returned for a second internship in their R&D department where I researched the formulation of foods colorants based from botanical sources. Upon graduation, I was offered a full-time position as an Application Scientist and have been enjoying my time exploring the food and beverage industry since then.
Missouri State's Chemistry Program did a wonderful job at preparing me for the workforce. Not only in terms of education, but also professionalism and communication skills. If I had to give a tip for current students, I would advise paying attention in Analytical and Instrumental classes. The knowledge acquired from these classes is used every day across multiple scientific industries and helps you stand out among others. In addition, lab courses at Mo State helped prepare me for report writing and communicating results (specifically pchem lab). The dedication that each professor gives to their teaching goes a long way in preparing one for the workforce. I am thankful to have the support and guidance from such a great community of scientists.

2023 ALUMNI SPOTLIGHT - continued

EMILY KEMPFER (BS 2017)

Emily Kempfer received her Bachelor's Degree in Chemistry from MSU in the Spring of 2017. During her time at MSU, she worked in an organic synthesis lab under Dr. Sedaghat-Herati; however, she found a real passion for Physical Chemistry after classes with Dr. Meints and Dr. Schick.

She took a year off from school to work as a quality control chemist in her hometown of St. Louis, Missouri, before beginning a PhD program at the University of Louisville in Louisville, Kentucky, in the Fall of 2018.

During her PhD program Emily focused on studying Computational Chemistry under the guidance of Dr. Lee Thompson. During her time as a PhD student, she was awarded two University Fellowships: the Doctoral Fellowship and the Arnos Spatola Fellowship, as well as the John M. Houchens Dissertation Prize and a Graduate Deans Citation. Emily defended her dissertation titled, "Development of Nonorthogonal Wavefunction Theories and Application to Multistate Reaction Processes" in February of 2023.

Following graduation, Emily began a post-doctoral research position, working under Professor Frank Neese at the Max-Planck-Institut für Kohlenforschung in Mülheim an der Ruhr, Germany. Currently, her research focuses on multireference methodologies and higher order excitations within the ORCA framework.

2023 ALUMNI SPOTLIGHT - continued

CHIDERAA NWACHUKWU (MS 2017)

Chideraa Nwachukwu was born and raised in Owerri, the capital city of Imo state in the southeastern part of Nigeria. He decided to travel over 300 miles to Ibadan (southwestern part of Nigeria), where he received his Bachelor's Degree in Industrial Chemistry from the University of Ibadan in 2014. After receiving his BS degree, he moved to Missouri State University, where he obtained his MS Degree in Chemistry in 2017, working with Dr. Eric Bosch. His thesis focused on the synthesis of novel imadole/pyridine-based ligands for silver and palladium complexation. He also worked on understanding the role of halogen bonding in the formation of co-crystals. While working with Dr. Bosch, Chideraa co-authored five peer-reviewed publications. After receiving his MS degree, he moved to the University of Utah, where he obtained his Ph.D. in Chemistry in 2021, under the supervision of Dr. Andrew Roberts, where his thesis focused on nickel catalyzed C-N bond cleavage to form C-C bonds. Chideraa currently works as a senior scientist at DuPont.

Chideraa says, "Many thanks to all the faculty members of the Chemistry Department at Missouri State University, especially, Dr. Eric Bosch, who taught me how to conduct research in organic chemistry. Coming from Nigeria with very limited research experience, Dr. Bosch taught me the basic techniques required to conduct organic chemistry research. Dr. Nikolay Gerasimchuk made me enjoy inorganic chemistry and that knowledge helped me excel in my Ph.D. research. I always felt like MSU was home away from home. Thanks to the MSU community for making my experience memorable."

Outside of work, Chideraa spends time with his wife and young daughter. He enjoys watching the English Premier League and the NBA. He also enjoys hiking and bowling.

GIVING

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

At the link above – choose a gift amount and select "click here to search or choose multiple designations" Type Chemistry into the search bar and enter, select one or both options below. If you don't see your designation, you will have the opportunity to enter gift details on the main page by selecting "I would like to write in my designation".

Thank you!

Be sure to check us out on Instagram! See all the cool and fun things happening in the department!

Follow us @mostatechem

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