



A NOTE FROM THE DEPARTMENT HEAD

I officially took over the position of Department Head of Chemistry on July 1, 2020 but I was already involved in departmental operations since late February 2020. This was just before the COVID-19 pandemic hit the United States. Suffice to say that things have not been back to normal ever since and they will not be for a while. Year 2020 is one that all of us will remember. Most activities in the Department were suspended for almost three months in the Spring-Summer 2020 due to COVID-19. All teaching activities migrated to online mode within weeks. Most research activities were shut down. We eventually returned to research in June and started preparing for fall teaching. Our brilliant faculty developed creative ways to teach while making sure students observed physical spacing protocols. Some introductory classes and labs moved entirely online while others adopted a combination of online and traditional/seated modes. Other faculty developed creative ways of shortening labs in such a way that enabled labs to be done in a fraction of the time. This enabled lab sections to be split in two in line with 50% maximum capacity COVID-19 occupancy limits.

We had a record number of ten students graduating with a Masters Degree in 2019 and 2020. Nikolay Gerasimchuk was the first recipient of Dr. Mathew and Patricia Harthcock College of Natural & Applied Sciences Faculty Fellowship Award. More faculty fellowships/professorships are in the pipeline and will be announced in the coming years. (Continued on the page 21)

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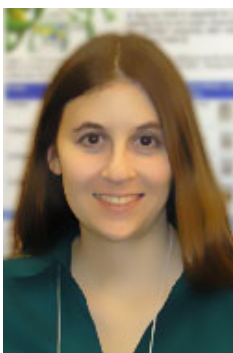
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FACULTY AND STAFF



Top (L to R): Keiichi Yoshimatsu, Fei Wang, Adam Wanekaya, Erich Steinle, Gautam Bhattacharyya, Eric Bosch, Gary Meints, Alan Schick, Mark Richter, Scott Curtis, Helena Metzker.

Bottom (L to R): Cyren Rico, Linda Allen, Jonathan Hardin, Bryan Breyfogle, Matthew Siebert, Reza Herati, Richard Biagioni, Marla Fritz, Natasha Devore.



INTRODUCING DR. NATASHA DEVORE

Dr. Natasha DeVore started as an assistant professor at MSU in Fall 2019. She graduated from the University of Kansas in 2011 with a Ph.D. in Biochemistry and Biophysics. She went on to do post-doctoral research at Los Alamos National Lab in Dr. Geoff Waldo's lab on a split version of green fluorescent protein. Since coming to MSU, Dr. DeVore's lab has been working on several different projects involving heme proteins. The main goal of most of these projects is to investigate the function of enzymes using Michaelis-Menten kinetics and the structure of the protein using X-ray crystallography.

STUDENT and FACULTY ACCOMPLISHMENTS

January 1, 2019 - December 31, 2020

Bhattacharyya, Gautam

Bhattacharyya, G. (2019). Construction by Deconstruction. *Journal of Chemical Education*, 96(7), 1294-1297.

Biagioni, Richard N.

Pearson, M. A., Biagioni, R. N., Gutierrez, M. (2019). Geochemical fractionation of stream sediments impacted by Pb-Zn mining wastes: Missouri, USA. *Mine Water and the Environment*, 38(June), 378-384.

Bosch, Eric

Nwachukwu, C., Bosch, E. (2020). Synthesis of 4-[(2-imidazolethynyl)]-5-(2-pyridylethynyl)veratrole and characterization of the coordination complexes with silver(I) and palladium(II). *Inorganica Chimica Acta*, 502, 119328.

Santana, C. J., Sinnwell, M. A., Bosch, E., MacGillivray, L. R., Groeneman, R. H. (2020). Application of a Tetrapyrimidyl Cyclobutane Generated in the Organic Solid State: A Halogen-Bonded Supramolecular Ladder. *CrystEngComm*, 22, 6780-6782.

Bosch, E., Battle, J. D., Groeneman, R. H. (2020). Crystal structure and photoreactivity of a halogen bonded co-crystal based upon 1,2-diiodoperchlorobenzene and 1,2-bis(4-pyridyl)ethylene. *Acta Crystallographica Section C*, 76, 557-561.

Bosch, E., Bowling, N. P. (2019). Supramolecular polymer formation featuring cooperative halogen-bonding and non-conventional sp²-CH---N hydrogen-bonding. *Crystal Growth and Design*, 19, 5929-5933.

Bosch, E., Kruse, S. J., Krueger, Jr., H. R., Groeneman, R. H. (2019). The role of pi-Stacking and Halogen Bonding of 1,4-Diiodoperchlorobenzene in the Organization of alkenes in the Solid State to Achieve a [2+2] Cycloaddition Reaction. *Crystal Growth and Design*, 19, 3092-3096.

Bosch, E., Kruse, S. J., Groeneman, R. H. (2019). Infinite and discrete halogen bonded assemblies based upon 1,2-bis(iodoethynyl)benzene. *CrystEngComm*, 21, 990-993.

Nwachukwu, C. I., Patton, L. J., Bowling, N. P., Bosch, E. (2020). Ditopic halogen bonding with bipyrimidines and activated pyrimidines. *Acta Crystallographica*,

Kruse, S. J., Bosch, E., Brown, F., Groeneman, R. H. (2020). Incorporating Ester Functionality within a Solid-State [2 + 2] Cycloaddition Reaction Based Upon Halogen Bonding Interactions. *Crystal Growth and Design*, 20(3), 1969-1974.

Bosch, E., Bowling, N. P. (2020). Cooperative Strong Charge Assisted N-H---O Hydrogen Bonding and Weaker Nonconventional C-H---N Hydrogen Bonding in the Formation of Extended Hydrogen Bonded Networks with 2,3,5,6-tetrafluorobenzoic acid. *Crystal Growth and Design*, 20(3), 1565-1571.

Juneja, N., Unruh, D. K., Bosch, E., Groeneman, R. H., Hutchins, K. M. (2019). Effects of pedal motion and static disorder on thermal expansion within halogen bonded co-crystals. *New Journal of Chemistry*, 43, 18433-18436.

Moaven, S., Andrews, M. C., Polaske, T. J., Karl, B. M., D. K. U., Bosch, E., Bowling, N. P., Cozzolino, A. F. (2019). Triple-Pnictogen Bonding as a Tool for Supramolecular Assembly. *Inorganic Chemistry*, 58, 16227-16235.

Bosch, E., Kruse, S., Reinheimer, E., Rath, N., Groeneman, R. (2019). Regioselective [2 + 2] cycloaddition reaction within a pair of polymorphic co-crystals based upon halogen bonding interactions. *CrystEngComm*, 21, 6671-6675.

Bosch, E. (2019). Crystal structure of the cocrystal salt 2-amino-6-bromopyridinium 2,3,5,6-tetrafluorobenzoate. *Acta Crystallographica E*, E75(2), 284-287.

Curtis, Scott

Curtis, S., Lottes, B., Robertson, D., Lindeman, S. V., Gerasimchuk, N. N. (2020). "Search for the shortest intermetallic Tl---Tl contacts: Synthesis and characterization of Thallium(I) coordination polymers with several mono- and bis-cyanoximes". *Inorganica Chimica Acta*, 508(August, 1).

STUDENT and FACULTY ACCOMPLISHMENTS

January 1, 2019 - December 31, 2020

Gerasimchuk, Nikolay N.

Gerasimchuk, N. N., Tyukhtenko, S. I. (2019). Inorganic Synthesis: A Manual for Laboratory Experiments. In n/a (Ed.), *no, original book*. Newcastle upon Tyne, NE6 2PA, UK: Cambridge Scholars Publishing.

Curtis, S., Lottes, B., Robertson, D., Lindeman, S. V., Gerasimchuk, N. N. (2020). "Search for the shortest intermetallic Tl---Tl contacts: Synthesis and characterization of Thallium(I) coordination polymers with several mono- and bis-cyanoximes". *Inorganica Chimica Acta*, 508(August, 1).

Dannen, S., Cornelison, L., Durham, P., Morley, J. E., Shahverdi, K., Du, J., Zhou, H., Sudlow, L. C., Hunter, D., Wood, M. D., Berezin, M. Y., Gerasimchuk, N. N. (2020). "New in vitro highly cytotoxic platinum and palladium cyanoximates with minimal side effects in vivo". *Journal of Inorganic Biochemistry*, 208(July), 111082.

Morton, J., Dennison, R., Nemykin, V., Gerasimchuk, N. N. (2020). "Planochromism of cyanoxime anions: Computational and mechanistic studies in solid state and solutions". *Inorganica Chimica Acta / Elsevier*, 507(July 1).

Gerasimchuk, N. N., Popis, S., Whited, M. (2019). Polymeric Composites with Silver (I) Cyanoximates Inhibit Biofilm Formation of Gram-Positive and Gram-Negative Bacteria.. *Polymers*, 11, 1018-1043.

Gerasimchuk, N. N. (2019). Chemistry and Applications of Cyanoximes and Their Metal Complexes.. *Dalton Transactions*, 48, 7985-8013.

Sandineni, P., Yaghoobnejad Asl, H., Gerasimchuk, N. N., Ghosh, K. C., Choudhury, A. (2019). Soft chemical routes to electrochemically active iron phosphates. *Inorganic Chemistry*, 58(7), 4117-4133.

Sandineni, P., H. Y. A., Gerasimchuk, N. N., Ghosh, K., Choudhury, A. (2019). Soft chemical routes to electrochemically active iron phosphates.. *Inorganic Chemistry*, 58, 4117-4133.

Kallu, J., Banerjee, T., Sulthana, S., Darji, S., Higginbotham, R., Fletcher, C., Gerasimchuk, N. N., Santra, S. (2019). Nanomedicine-Assisted Combination Therapy of NSCLC: New Platinum-Based Anticancer Drug Synergizes the Therapeutic Efficacy of Ganetespi.. *Nanotheranostics*, 120-134.

Opalade, A. A., Gomez-Garcia, C., Gerasimchuk, N. N. (2019). New Route to Polynuclear Ni(II) and Cu(II) Complexes with Bridging Oxime Groups That Are Inaccessible by Conventional Preparations. *Crystal Growth and Design*, 19(2), 678-693.

Meints, Gary A. J.

Bakker, M., Boyd, B., Meints, G. A. (2019). 3D Printed NMR spectra: From 1D and 2D acquisition to 3D visualization. *Concepts in Magnetic Resonance A/Wiley Online*, 47A(e21470), 6. doi.org/10.1002/cm.a.21470

Rico, Cyren

Rico, C., Wagner, D., Abolade, O. M., Lottes, B., Rico, C. (2019). Metabolomics of wheat grains generationally-exposed to cerium oxide nanoparticles. *Science of the Total Environment*, 712.

Rico, C., Abolade, O., Wagner, D., Lottes, B., Biagioni, R. (2019). Wheat exposure to cerium oxide nanoparticles over three generations reveals transmissible changes in nutrition, biochemical pools, and response to soil N. *Journal of Hazardous Materials*.

Wanekaya, Adam K.

Reaz, M., Haque, A., Cornelison, D. M., Wanekaya, A. K., Delong, R., Ghosh, K. C. (2020). Magneto-luminescent Zinc/Iron oxide core-shell nanoparticles with tunable magnetic properties. *Physica E: Low-dimensional Systems and Nanostructures*, 123 114090

Hernandez, C. G., Freese, A. K., Rodriguez-Mendez, M. L., Wanekaya, A. K. (2019). In-situ Synthesis, Stabilization and Activity of Protein-Modified Gold Nanoparticles for Biological Applications. *Biomaterials Science*, 7, 2511 - 2519.

STUDENT and FACULTY ACCOMPLISHMENTS

January 1, 2019 - December 31, 2020

Wang, Fei

Misra, S., Koley, B., Mahato, S., Wang, F., Jana, P. (2020). Unusual crystallographic ordering of two neighbouring elements - Cd and In in Cd₂Cu₃In, the first example in ternary Laves phase. *Journal of Alloys and Compounds*, 844, 156054.

Decocq, V., Gui, X., Neeson, A., Heitmann, T., Xie, W., Wang, F. (2020). Crystal Structure, Superconducting Properties and Coloring Problem in ReAlSi and ReGaSi. *Inorganic Chemistry*, 59, 17310 - 17319.

Jana, P., Misra, S., Malick, S., Koley, B., Chatterjee, S., Wang, F. (2020). Chemical substitution of Zn in the structure of ordered Cu₆Zn₂Sb₂: a structural and theoretical study. *Solid State Sciences*, 107, 106333.

Yoshimatsu, Keiichi

Ellis, J. D., Iqbal, R., Yoshimatsu, K. (2020). A new approach for IR spectra matching using normalized local change. *Elsevier Analytica Chimica Acta*.

Koide, H., Fukuta, T., Okishima, A., Ariizumi, S., Kiyokawa, C., Tsuchida, H., Nakamoto, M., Yoshimatsu, K., Ando, H., Dewa, T., Asai, T., Oku, N., Hoshino, Y.,

Shea, K. J. (2019). Engineering the binding kinetics of synthetic polymer nanoparticles for siRNA delivery. *Biomacromolecules*, 20(10), 3648-3657.

Yoshida, H., Kojima, K., Shiota, M., Yoshimatsu, K., Yamazaki, T., Ferri, S., Tsugawa, W., Kamitori, S., Sode, K. (2019). X-ray structure of the direct electron transfer-type FAD glucose dehydrogenase catalytic subunit complexed with a hitchhiker protein. *Acta Crystallographica Section D STRUCTURAL BIOLOGY*, D75(Part 9), 841-851.

Koide, H., Yoshimatsu, K., Hoshino, Y., Ariizumi, S., Okishima, A., Ide, T., Egami, H., Hamashima, Y., Nishimura, Y., Kanazawa, H., Miura, Y., Asai, T., Oku, N., Shea, K. J. (2019). Sequestering and inhibiting a vascular endothelial growth factor in vivo by systemic administration of a synthetic polymer nanoparticle. *Journal of Controlled Release*, 295, 13 - 20.

Odom, T. L., Blankenship, J. R., Campos, G., Mart, D. C., Liu, W., Wang, R., Yoshimatsu, K. (2020). Effect of vortex-induced physical stress on fluorescent properties of dye-containing poly(ethylene glycol)-block-poly(lactic acid) micelles. *To appear in Journal of Applied Polymer Science / John Wiley & Sons, Inc.*, 138(4), 49743.

STUDENT ACCOMPLISHMENTS

Congratulations to the 2020 CNAS Undergraduate Research Symposium award winners

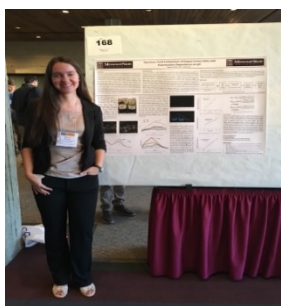
1st place – Giselle Campos: presented “NMR Studies of Poly(Ethylene Glycol) - Poly(Lactic Acid) (PEG-PLA) Block Copolymer Micelles at Different Temperatures.” Her faculty advisor is Dr. Keiichi Yoshimatsu, assistant professor of chemistry.

2nd place – Autumn Pilarski: presented “¹H solution NMR analysis of a non-palindromic DNA sequence containing a U:G mismatch.” Her faculty advisor is Dr. Gary Meints, associate professor of chemistry.

3MT Competition

Congratulation to Mehwish Khokhar and Tyler Odom for being among the best in the College of Natural and Applied Sciences (CNAS). The two were among the four students that represented CNAS in the university-wide competition.

Megan Prado is the first winner of the Dr. Matthew and Patricia Harthcock Chemistry Research Fellowship Award



Chemistry graduate student, Megan Prado received the Dr. Matthew and Patricia Harthcock Chemistry Research Fellowship Award in the amount of \$1,500 for the 2020-21 school year. The award is renewable contingent on her GPA, teaching reviews and research progress, and enables her to continue her graduate studies and research at Missouri State. We thank Dr Matthew Harthcock and Patricia Harthcock for their generosity.

Megan Westwood, Best Poster Award for 2019. Megan is pictured on the right, accepting the Best Poster Award for her poster titled, “¹H and ³¹P solution NMR investigation of G:T mismatches in DNA,” **Megan N. Westwood**, Gary A. Meints. This honor was received at the 2019 Great Plains Regional Annual Symposium on Protein and Biomolecular NMR (GRASP), November 23, 2019, University of Kansas, Lawrence, KS.



STUDENT ACCOMPLISHMENTS

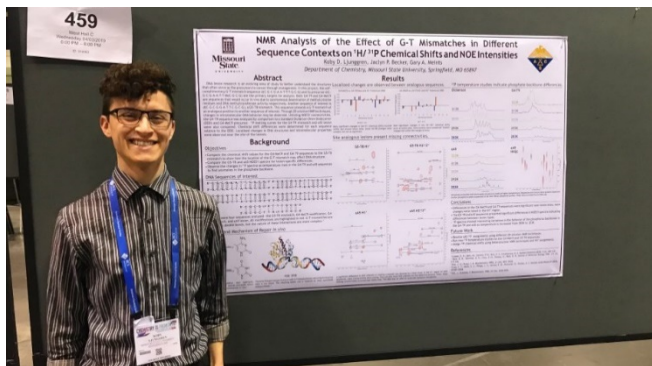
Chemistry graduate Kameron Coates reflects on new role and the path to teaching



Kameron Coates considered his student teaching position at Willard High School a dream come true. Following graduation, Coates will continue at the school in a full-time science teaching position, transitioning from student teacher to science teacher at the high school. In his position, he strives to foster relationships.

“When students can connect with their teachers, they have more willingness to learn,” Coates said. “Each student is different, but every student matters.” Coates’ enthusiasm for the position in part stems from the high school’s top performance in the local area. State tests and academic competitions have shown that Willard High School produces some of the top performing, college-ready graduates of southwest Missouri.

Koby Ljunggren wins Outstanding Poster at National ACS Conference.



Koby Ljunggren from Battlefield MO won the Outstanding Student Poster Award in the Division of Pchem at the ACS Conference in Orlando FL in Spring of 2019.

STUDENT ACCOMPLISHMENTS

Congratulations to the Chemistry Department Scholarship and Award Winners

The COVID-19 Pandemic has changed many aspects of our lives in 2020, including our ability to gather together in person and celebrate our winners at our annual spring banquet. However, that did not stop us from being proud of your accomplishments, persistence, and success. Every one of our students have tolerated and accepted change that they never expected this year. Everyone in our department has stepped out of their comfort zone and learned and embraced new ways of doing things, and continued to move forward. We are Bears. We are innovators. We will continue to make a difference in our world.



Chemistry Dept. Scholarship Fund

2019-Abigail Cunningham
2020-Sarah Longworth and Catherine Smith

Harriett H. Ford Memorial Scholarship

2019-Caitlin Padgett
2020-Victoria Ogbeifun and Abigail Westrum

Louise & Roland Harthcock Scholarship

2019-Cassidy Soard
2020-Rebekah Nagle

Dr. & Mrs. Vernon Thielmann Chemical Education and
Chemistry Undergraduate Research Award

2019-Abbie Ritter, Matthew Schlottman, Kameron
Coates, Amber Florence, Catherine Smith
2020-Matthew Schlottman, Zachary Studdard

Wyman & Sue Grindstaff Chemical Education Scholarship

2019-Tericka Brown, Dane Wagner
2020-Matthew Schlottman

STUDENT ACCOMPLISHMENTS

Congratulations to the Chemistry Department Scholarship and Award Winners

Chem Board of Advisors Summer Research Fellowship	2019-Michael Abolade and Koby Ljunggren 2020-Adjoa Adams and Nicole Walker
Doris C. Lorz Scholarship	2019-Emma Sanders and Rebekah Nagle 2020-Andrew Stoll
Emil Lorz Memorial Scholarship	2019-Sarah Longworth and Andrew Stoll 2020-Trinity Takahashi, Emma Fonke, Aaron Autry, and Hannah Parkes
Foundation for Immunotoxicology Award	2019-Jessica Bruer 2020-Autumn Pilarski
Dr. Robert W. Martin Research Fellowship	2019-Jeremiah Ukena and Catherine Smith 2020-Sarah McKenzie, Jane Jackovich, Claire Nieder
Eugene T. Scafe Memorial Scholarship	2019-Giselle Campos, Alexander Babel, Chloe Keyes, Jaclyn Lewis, Tara Poole 2020-Jaclyn Becker, Alexander Babel, Chloe Keyes, Tara Poole, Giselle Campos
Robert Lloyd Ernst Summer Graduate Assistantship	2019-Melinda Sutton 2020-Arkanil Roy and Luckio Owuocha
Robert S. Christie Memorial Scholarship	2019-Megan Westwood, Giselle Campos, Brett Lottes 2020-Megan Westwood, Megan Prado, Paige Harman, Chad Lakin, Giselle Campos, Seth Adu Amankrah
WEB & AOB Scholarship	2019-Jessica Bruer 2020-Seth Adu Amankrah and Jaclyn Becker
William J. Husa Chemistry Scholarship	2019 - Autumn Pilarski 2020 - Samia Tahsin
POLYED Undergraduate Organic Chemistry Award	2019 - Michela Rollins 2020 - Nicole Walker
ACS Undergraduate Award in Analytical Chemistry	2019 - Chloe Keyes 2020 - Nicole Walker
Outstanding Environmental Chemistry Student	2019 - Dane Wagner 2020 - Zachary Dobbs and Hannah Parker

STUDENT ACCOMPLISHMENTS

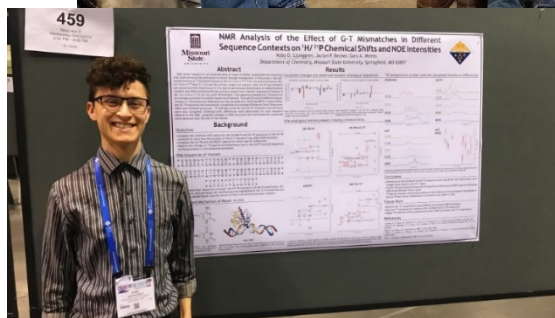
Congratulations to the Chemistry Department Scholarship and Award Winners

General Chemistry Achievement Award	2019 - Darren Kirsch 2020 - Emma Taylor
Outstanding Physical Chemistry Student Award	2019 - Hannah Eberle 2020 - Chloe Keyes
Outstanding Biochemistry Student Award	2019 - Hannah Eberle 2020 - Autumn Pilarski
ACS Undergraduate Award in Inorganic Chemistry	2019 - Grant Dolan 2020 - Darren Kirsch
Outstanding Inorganic Chemistry Student Award	2019 - Michael Bakker 2020 - Manuel Meyer
Outstanding Senior	2019 - Hannah Eberle 2020 - Koby Ljunggren

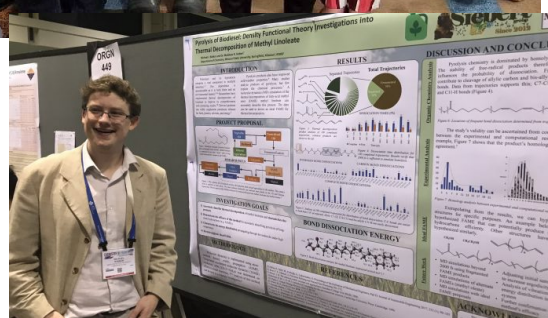
We thank all the donors for their generosity

Student presenters at the ACS National Conference in Orlando FL in 2019.

Pictured left to right: Scott Curtis, Mike Bakker, Jaclyn Becker, Ben Boyd, Megan Prado, Molly Duszynski, Koby Ljunggren, and Allison Freese.

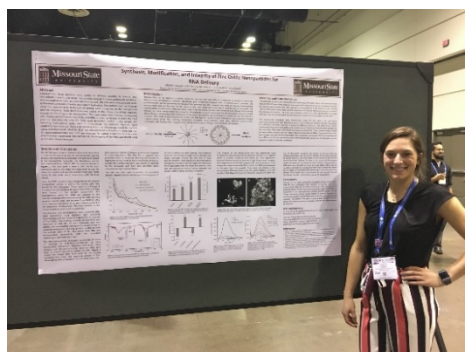


Above: Koby Ljunggren



Below: Allison Freese

Above: Mike Bakker



STUDENT ACCOMPLISHMENTS

2020 Mid-South Inorganic Chemists Association (MICA) meeting



From left to right: 2 students from Conway, AR [University of Central Arkansas]; Prof. Charles Mebi, Dept. Head from Russelville, AR [Arkansas Tech University]; Prof. Allen Abplett [Oklahoma State University]; Prof. Burt Hollandsworth [Lyon College, AR], Abigail Cunningham – MSU CHM student; Kevin Pinks – MSU CHM student; Dr. Nikolay Gerasimchuk, Professor of Chemistry, MSU; Adu Seth – MSU CHM student; Manuel Meyer – MSU CHM student; Alexander Babel – MSU CHM student.

Kevin Pinks, chemistry graduate student, presented “Organoantimony(V) Cyanoximates: Synthesis, Spectra, Structures and Biological Activity.”

Scott Curtis, chemistry instructor, presented “Investigations into the Chemistry of the First Non-chelating Bis-cyanoximes.”

Dr. Nikolay Gerasimchuk himself presented “Why Work with Thallium?”

STUDENT ACCOMPLISHMENTS

Congratulations to our 2019 – 2020 graduates. We are proud of your accomplishments!



STUDENT ACCOMPLISHMENTS

Congratulations to our 2019 – 2020 graduates. We are proud of your accomplishments!

Spring 2019

Masters Degree

Brandy Bates (Steinle)
Allison Freese (Wanekaya)

Bachelors Degree

Eric Blalack (Schick)
Tate Brand
Jessica Bruer (Schick)
Carajill Campbell (Schick)
Amanda Dobson (Yoshimatsu)
Grant Dolan (Herati)
Hannah Eberle (Biagioni)
Peli Godden (Herati)
Ethan Harmon (Siebert)
Jaden Kelly (Biagioni)
Devin Mart (Yoshimatsu)
Emily McClain (Bosch)
Daryl Meyer (Wang)
Emily Nowak (Fichter)
Jennifer Ohnesorge
Megan Peitz (Rico)
Emily Pouncy (Biagioni)
Lauren Reading (Schick)
Ethan Reece (Biagioni)
Husref Rizvanovic
Jounee Rodney
Cathy Seitz (Meints)
Alize Shaffer (Wang)

Summer 2019

Masters Degree

Oluwasegun Abolade (Rico)
Molly Duszynski (Fichter)

Bachelors Degree

Shane Bauman
Sarah Braun (Rico)
Nathan Suthoff (Biagioni)
Cody Turner (Meints)

Fall 2019

Master Degree

John Bledsoe
Benjamin Boyd (Meints)
Brandy Dotson (Steinle)

Bachelors Degree

Landen Croteau (Steinle)
Tyler Joseph (Biagioni)
Brett Lottes (Rico)
Tyler Odom (Yoshimatsu)
Dane Wagner (Rico)
Megan Westwood (Meints)

Spring 2020

Masters Degree

Michael Bakker (Siebert)
Jessica Bruer (Schick)

Bachelors Degree

Hussain Alhashim (Rico)
Jaclyn Becker (Meints)
Roshonda Carpenter
Kameron Coates (Rico)
Lily Edwards
Rebecca Eldredge (Stenle)
Peter Gakuo
Laurel Gibson (Devore)
Tyler Hedrick
Ethan Hickey (Yoshimatsu)
Chloe Keyes (Durham)
Jessica Lang (Wanekaya)
Koby Ljunggren (Meints)
Alexis Miller (Steinle)
Sydney Olbertz (Biagioni)
Onika Olson (Breyfogle)
Megan Prado (Wanekaya)
Abbie Ritter
Michaela Rollins (Siebert)

Emma Sanders (Wanekaya)
Kevin Vo
Jenna Williams (Meints)

Summer 2020

Masters Degree

Adjoa Adams (Yoshimatsu)
Victoria Decocq (Wang)
Alec Neeson (Wang)
Samuel Njoku (Schick)
Luckio Owuocha (Yoshimatsu)
Kevin Pinks (Gerasimchuk)
Arkanil Roy (Siebert)

Fall 2020

Masters Degree

Jeffrey Maskrod
Tessa Middleton (MNAS)
Cody Turner (DeVore)

Bachelors Degree

Aaron Davidson (Schick)
Zachary Dobbs (Rico)
Cody Jones (Bhattacharrya)
Amber Kimball (Steinle)
Cammi Kjetland (DeVore)
Hannah Lundien (Bhattacharrya)
Danielle Pounds
Sarahi Vera
Cameron Weeks (Wang)

ALUMNI SPOTLIGHT



Mary Krause (BS, MS 2005), Associate Scientific Director, Bristol Myers Squibb

Mary Krause was born and raised in Springfield, then became a Chemistry Bear in 2001. She received her BS in chemistry in May 2005, then completed her MS through the Accelerated MS program in August 2005, working with Dr. Biagioni on her thesis project focused on analytical method development and sample testing for the Jordan Creek water quality project. She entered a PhD program in Chemistry at the University of Kansas as a Madison and Lila Self Graduate Fellow, which is a four year fellowship with an accompanying professional development program. Towards the end of her PhD training, Mary spent six months as a co-op in the Late Stage Pharmaceutical Development department at Genentech, Inc. Mary's graduate research focused on characterization of a metal binding peptide tag and resulting metal complexes. After earning her PhD in 2011, Mary completed two years of postdoctoral training in the Department of Pharmaceutical Chemistry at the University of Kansas as a PhRMA Foundation Post-Doctoral Fellow. During her postdoc, Mary drove exploration of pharmaceutical applications of the peptide tag, including novel platinum-protein conjugates for use as targeted anti-cancer therapeutics. This technology was out-licensed from the university to a small startup company, where Mary later worked as a Scientist.

Mary is currently an Associate Scientific Director in Drug Product Development at Bristol Myers Squibb in New Brunswick, NJ. In this role, Mary leads a group of formulation scientists and supports formulation and process development of biologic drug products. She serves as a drug product development team leader for parenteral products, where she has led product teams in developing both monoclonal antibodies and novel protein-based modalities, such as antibody drug conjugates and bispecific antibodies. Her research focuses on physical and chemical degradation of proteins that can occur during development and manufacturing; in particular, she focuses on metal-catalyzed oxidation of proteins and protein behavior at interfaces. One of her recent accomplishments was editing a book for inclusion in the *AAPS Advances in the Pharmaceutical Sciences* series. Mary is also passionate about mentoring the next generation of scientists, in particular through leading a BMS-Rutgers mentoring program for women in STEM and serving on her department's University Relations team.

Mary is thankful to all of the professors at Missouri State for providing an excellent education and scientific foundation. She believes that this foundation allowed her career to be rooted in a deep understanding of scientific principles. "Dr. Biagioni taught me how to perform independent research and how to come up with a creative solution to any lab challenge. Dr. Gerasimchuk inspired my love of inorganic chemistry, which led to my pursuit of a PhD in this space. Dr. Jahnke encouraged me to enter straight into the PhD program after completing my MS, and she has been a continued mentor and advisor throughout various stages of my career."

Outside of work, Mary spends time knitting, playing guitar, and taking her dog on walks to explore the many parks and beaches across NJ. When not in a global pandemic, Mary enjoys traveling back to Missouri to visit family and friends and spending time in the mountains in Colorado.

ALUMNI NEWS

We enjoy hearing from our Chemistry alumni and friends! Please send us an e-mail at chemistry@missouristate.edu. Include your current contact information, year of graduation and degree earned. Let us know where you are working now, job title or other career accomplishments, and we can include that in the next newsletter. Stay current with the MSU Alumni Association at: <http://alumni.missouristate.edu>. Here you can update your contact information online and learn about upcoming alumni events, such as MarooNation.

Adedamola Opalade (MS 2016), recently won the Golden Torch Award from the National Society of Black Engineers (NSBE). He received the award in Detroit, Michigan. It is based on academic achievement, personal accomplishments and demonstrated leadership in science and engineering. Congratulations!



Recent alumni updates (occurring in 2020).

Abolade, Oluwasegun (MS 2019), Ph. D. Program, University of Connecticut, Storrs, CT

Adams, Adjoa (MS 2020), Ph. D. Program, University of Arkansas, Fayetteville, AR.

Agana, Bernice (MS 2014), Postdoc, Medical University of S. Carolina.

Bruer, Jessica (MS 2020), Sensient Technologies Corporation, St. Louis, MO.

Coates, Kameron (BS 2020), Teacher, Willard High School, Willard MO.

Craft, Tyler (BS 2015), Clinical Pharmacy Coordinator, Phelps Health, Rolla MO.

Dobbs, Zachary (BS 2020), Missouri Department of Natural Resources, Jefferson City, MO

Eldredge, Rebecca (BS 2020), Analytical Research Associate, Brewer Science, Rolla MO.

Kjetland, Cammie (BS 2020), Masters Program, Missouri State University, Springfield, MO.

Krause, Mary, (BS 2005, MS 2005), Associate Scientific Director, Bristol Myers Squibb.

Lang, Jessica (BS 2020), Chemist, Merieux Nutrisciences, Springfield MO.

Luckio, Frank (MS 2020), Ph.D. Program, University of Missouri, Columbia, MO.

Lundien, Hannah (BS 2020), Masters Program, Missouri State University, Springfield, MO.

Matt, Devin (BS 2019), Territory Manager, Danaher Corp.

Mbugua, Joseph (MS 2005), Controls Engineer, Schreiber Foods, Monett MO.

Middleton, Tessa (MS 2020), Missouri State Highway Patrol, Springfield, MO.

Miller, Alexis (BS 2020), Masters Program, Missouri State University, Springfield, MO.

Neeson, Alec (MS 2020), Research Associate, Brewer Science, Springfield, MO.

Njoku, Samuel (MS 2020), Ph. D Program, University of Houston, Houston, TX.

ALUMNI NEWS

Recent alumni updates (occurring in 2020).

Osswald, Heather (BS 2012) Scientist, Nuerocine Biosciences, San Diego CA.

Prado, Megan (BS 2020), Masters Program, Missouri State University, Springfield, MO.

Proctor, Aaron (MS 2014) Postdoc, University of Colorado, Boulder CO.

Reynolds, Taylor (BS 2012), Technical Service Representative, Aegis Chemical Solutions, San Antonio, TX.

Roy, Arkanil (MS 2020), Ph. D Program, University of North Texas, Denton TX.

Sanders Emma (BS 2020), Lab Analyst, Elite Pain Management, Springfield MO.

Sarpong, Kwabena (MS 2010) Lecturer, University of Ghana.

Schmidt, Amy (BS 2013), Quality Engineer, Boeing.

Thomas, Preston, (BS 2016), Dentist, Mountain Grove, MO.

Tiegs, Brandon (BS 2010), Quality Assurance Officer, Sinclair Research, Auxvasse, MO.

Trammel (Freese), Allison (BS 2018, MS 2019), Clinical Lab Scientist, Viracor Eurofins Bio Pharma, Lees Summit MO.

FACULTY ACCOMPLISHMENTS

Faculty and Staff Awards 2019-2020

2019 Faculty Excellence in Research Award - Associate Professor Matt Siebert

2019 Faculty Excellence in Teaching Award - Senior Instructor Helena Metzker

2019 Faculty Excellence in Service Award - Associate Professor Erich Steinle

2019 Faculty Excellence in Service Award - Senior Instructor Helena Metzker

2019 Student-Nominated Award for Excellence - Professor Alan Schick

2020 Faculty Excellence in Teaching Award - Associate Professor Gary Meints

2020 Staff Excellence Award - Administrative Assistant Linda Allen

2020 General Education Assessment Award - Professor Richard Biagioni



FACULTY ACCOMPLISHMENTS

Climbing up the ranks



Dr. G. Bhattacharyya, granted tenure and promoted to associate Professor



Helena Metzker, promoted to Senior Instructor.

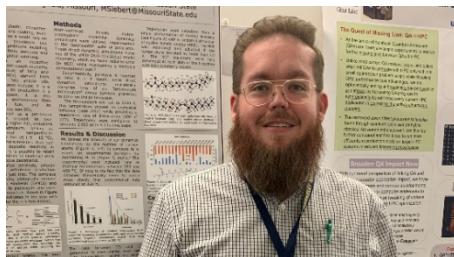
Dr. Gary Meints Receives NACADA's 2020 Outstanding Advisor Award

This year has been an impressive one for **Dr. Gary Meints**, associate professor of chemistry. In March, he received the **Curtis P. Lawrence Award for Excellence in Faculty Advising**. Following review of Meints' Lawrence Award application, the National Academic Advising Association (NACADA) has awarded him their **Outstanding Advising Award – Faculty Academic Advising for 2020**. "I want to express my appreciation to my advisee, who nominated me for the Lawrence Award and to Ross Hawkins from the Advising Center, who submitted the NACADA application," Meints said. "I also want to thank the individuals who wrote letters of support for my applications." NACADA advocates for academic advising in higher education. Their global awards support individuals and institutions who make significant contributions through academic advising.



Dr. Nikolay Gerasimchuk files for patent.

In October of 2020 the IP disclosure "**New class of non-antibiotic antimicrobial compounds**" was filed with Missouri State University for the purpose of joint patent application with Oklahoma State University, which now turned into a provisional patent application submitted to the national patents-&-trademarks office.



Dr. Matthew Siebert, associate professor of chemistry, was appointed as associate member of the American Chemical Society (ACS) Committee on Ethics for the 2020 calendar year, which was followed by an appointment as a full member for 2021-2024. Siebert was already active in ACS as the chair of the Ozarks local section and the program chair for the 2020-turned-2021 Midwest regional meeting, to be held in Springfield, Missouri. The Committee on Ethics works to maintain high levels of integrity and ethical conduct in the chemistry community. Dr.

Siebert confers with the committee at both national ACS meetings.

With support from the Missouri Soybean Merchandising Council (MSMC), Dr. Siebert is also investigating the production of gasoline and other chemical commodities computationally. The approach requires formation of biodiesel, followed by a process called pyrolysis. This pyrolysis, as an established process in the petroleum industry, requires no new infrastructure for creation or transportation of the fuel. Given that biodiesel is derived from biological sources, starting with carbon sequestration, this work has garnered substantial interest as a source of “carbon-neutral” or “green” petroleum. Thus far Dr. Siebert and his students have collected data regarding pyrolysis of the common chemical constituents of biodiesel, including methyl oleate and methyl linoleate. With the help of this funding from the MSMC, Dr. Siebert looks forward to presenting this work at the Spring 2021 National Meeting & Exposition of the American Chemical Society, as well as submission of a manuscript to a peer-reviewed journal.

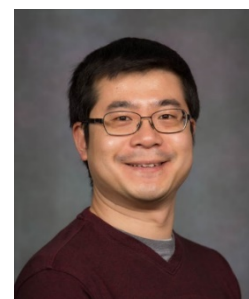
Dr. Nikolay Gerasimchuk, wins the Dr. Matthew and Patricia Harthcock College of Natural and Applied Sciences Faculty Fellowship Award.



The newly endowed faculty fellowship award supplements faculty recipients’ supplies, salary or student support to aid in their research efforts. “I plan to prepare an expanded series of two types of organoantimony(V) and platinum(II) compounds containing new water-soluble and biologically active cyanoximes. Thus, we will be able to determine SAR – structure-activity-relationship – that will help to guide to the most active compound(s) that we will pursue as drug candidates. Therefore, four-year fellowship will be a very good opportunity to complete outlined above applied research and create conditions for opening a company at Missouri State that will bring the best performing compounds to medical use” Dr. Gerasimchuk said.

Dr. Fei Wang received a three-year grant from the American Chemical Society’s Petroleum Research

Dr. Fei Wang recently received a three-year grant from the American Chemical Society’s Petroleum Research Fund to aid in his research. Much of hydrogenation catalysts today are platinum-based. While platinum is efficient, the precious metal is also expensive. Wang explores how replacing platinum with base metal intermetallic compounds could offer a much lower cost. The grant will provide \$70,000 in total to support Wang’s research over the three-year period. More than \$11,000 per year will pay for undergraduate and graduate student researchers. “With this support, we will be able to encourage more students — especially those at the undergraduate level — to take part in research,” Wang said.



American Chemical Society Student Affiliates

The ACS 2019 - 2020 Officers: President - Megan Prado
Vice President - Darren Kirsch
Treasurer - Taylor Avery
Secretary - Samia Tahsin
Historian - Autumn Pilarski
Recruitment Chair - Jeremiah Ukena

The American Chemical Society provides students of chemistry, chemical engineering, and related disciplines the opportunity to become better acquainted, to secure the intellectual stimulation that arises from professional association,

to obtain experience in preparing and presenting technical material before chemical audiences, to foster a professional spirit among the members, to instill a professional pride in chemistry and chemical engineering, and to foster an awareness of the responsibilities and challenges of the modern chemist through professional and social activities.



Pictured above: Competing in the **Sertoma Chili Cook-Off** with Dr. Biagoni is a yearly, and very spicy, tradition for the ACS team.



Pictured Left: **Demos in the Dark** is a Halloween themed event with chemical demonstrations for the public.



The ACS at the 2019 **Student Expo**. Pictured above, from left to right: Daryl Meyer, Megan Prado, Jerica Henry, and Taylor Avery.

(A NOTE FROM THE DEPARTMENT HEAD – continued from page 1)

One professorship will be funded by Prof. Jerry Atwood while Dr. David Osborne will fund the other fellowship. On the student side, Megan Prado was the first recipient of Dr. Matthew and Patricia Harthcock Chemistry Research Fellowship Award in July 2020. We are grateful for the continued support from donors.

The Department has had a very impressive publication and external grant funding in 2020. The latest external grants were awarded to Dr. Fei Wang who received funding from the American Chemical Society and Dr. Matthew Siebert who received funding from the Missouri Soybean Merchandising Council. In total there are about half a millions dollars active grants that faculty in the Department are principal investigators or co-principal investigators.

I am grateful to the previous Dept Head, Dr. Bryan Breyfogle for successfully steering the Department in the right direction over the past years. It will be a tall order to fit in his shoes. The future of the Chemistry Department remains bright, and I feel fortunate to play a key role in preparing for it. Natasha DeVore joined our team in the Fall of 2019 and we are in the process of looking for another Biochemistry team member who, hopefully, will join us in fall of 2021. Thanks to our alumni and friends for their support. We look forward to strengthening these relationships. I hope 2021 is prosperous for you, both personally and professionally.

Adam Wanekaya

A NOTE FROM THE PREVIOUS DEPARTMENT HEAD

Within this newsletter, you'll read about recent (2019-20) accomplishments by our students, faculty, and staff, so I'll attempt to present a broader 5-year summary of my time as department head from July 1, 2015 through June 30, 2020. It is my hope that the department progressed under my leadership, and that it continues to do so in the future through the capable leadership of our new department head, Dr. Adam Wanekaya.

The chemistry department received renewed American Chemical Society (ACS) Certification for our comprehensive BS degree in 2016-17. The department underwent a self-study and an external review of our programs in 2017. These processes were aided by helpful faculty, staff, students, and the dedicated and generous members of our Chemistry Advisory Board. An Action Plan was developed following the self-study and external review. That plan has led to a number of curriculum changes, new/replacement instruments, and a multitude of smaller changes that I believe have made the department more efficient, better prepared for the future, and most importantly improved the students' experiences and success. I am extremely grateful to everyone who contributed to these accomplishments. An example of one of these improvements would be the new major instruments: Agilent ICP-MS (funding obtained primarily by Dr. Rico and Dr. Biagioni via the NSF), Shimadzu Preparatory HPLC, Horiba Fluorimeter, SpectraMax M5 Micro Plate Reader, FTIRs, Nanalysis Benchtop NMR.



There was some turnover in the department with retirement and new hires, but overall very little during those 5 years. Several faculty were tenured/promoted, many won awards (including staff awards), published papers, and were generally productive. A total of 83 students earned BS/MS degrees and are now amongst the Alumni hopefully reading this newsletter—Congratulations to all of you! The generosity of our donors (alumni, advisory board, friends, former faculty and staff) has led to an increased number of student scholarship and award funds, as well as endowed funding for faculty.

Of course I would be remiss to not mention the most recent challenges of dealing with the COVID-19 pandemic. The faculty, staff, and students have risen to the challenges of teaching and learning online, in social-distanced teaching and research labs, and wearing of appropriate protective equipment.

Lastly, I ask that everyone continue to support the department by whatever means you are able, whether that be via monetary support, giving a departmental seminar in your area of expertise (virtually or in person), or volunteering your time for expert judging, advisory board membership, etc. I believe the chemistry department will thrive under the new leadership of Dr. Adam Wanekaya, who you will also be hearing from within this newsletter.

Bryan Breyfogle

Giving

State universities could not 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, donate online at:

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

Thank you!

A special thanks to Ashley Lenahan, Marla Fritz, Adam Wanekaya, and Bryan Breyfogle for their contributions to this issue of *Molecules and Moles*, the Chemistry Department Newsletter.

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