

CHEMISTRY **NEWS**

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

SPRING 2022



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and Stephanie Wood

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From the Chair

Two years have passed since our last newsletter. Wow, how our world has changed and been challenged by the Covid-19 pandemic. From the Department to you and your family, we hope you are safe, well and successfully managed the pandemic both personally and professionally.

The rapid switch to on-line learning in March 2020 was a tremendous accomplishment by the faculty with a very positive outcome for students under trying circumstances. New technology was quickly learned and employed to ensure students stayed on track academically in their degree programs. WebEx, Zoom and Blackboard Collaborate are now commonplace for safe and effective instruction, meetings and defenses. Spring 2022 brings us hope that instruction and research will return to a sense of normalcy.

Upon return to face-to-face instruction and reopening of research labs, the chemistry stockroom was designated as a source for supplying personnel protective equipment (PPE) to Main Campus research laboratories. Despite challenges sourcing PPE, the stockroom provided researchers and academic departments across campus with materials needed to reopen safely and was a constant source of critical lab supplies to maintain essential research functions during the shutdown. The stockroom staff also redesigned the chemistry teaching laboratories and developed protocols to facilitate safe and effective face-to-face lab instruction that we will continue to employ moving forward as best practices.

Research funding has taken a major step forward led by Michael Young, Emanuela Gionfriddo and Matt Wohlever, each receiving prestigious NSF CAREER Awards. NIH awards to Wei Li, Ajith Karunarathne,

Matt Wohlever, Steve Suchek, John Bellizzi and Mike Young; industrial and national lab collaborations for Mark Mason, Dragan Isailovic, Emanuela Gionfriddo and Cora Lind-Kovacs; and Ohio Sea Grants for Emanuela Gionfriddo and Dragan Isailovic were also realized. Such excellence has established outstanding research opportunities for our undergraduate and graduate students, and increased discoveries for the scientific community.

Despite challenges brought about by the pandemic, the department is moving forward to continue providing quality instruction in teaching and research. Through one important initiative, Amy Toole, Kristi Mock and Lisa Zhurova were selected as Equity Champions as part of the campus wide Student Experience Project to promote equity and a sense of belonging for STEM efficacy and identity for historically underserved students at the University. In addition, to improve safety readiness, chemical storekeepers, Stephanie Kaetzel and Tony Kaminiski attended emergency response training at The Center for Domestic Preparedness at the Anniston Army Depot in Anniston, Alabama, where they became certified in hazardous material operations. Both initiatives are critical to support our students and programs.

As always, please keep in touch, stop by and visit, and send us your news and career updates.

Best regards,



DEPARTMENT UPDATES



Michal Marszewski

joined the department in spring 2021 as an assistant professor of inorganic chemistry. His

research focuses on the design, synthesis and characterization of nanoporous materials for energy and environmental applications. Dr. Marszewski received his Ph.D. degree in 2016 from Kent State University after completing his research on the synthesis of crystalline mesoporous titania photocatalysts under the supervision of Professor Mietek Jaroniec. He was also active in the development of novel microporous and mesoporous carbons for adsorption of CO_2 , H_2 and volatile organic compounds. Subsequently, he joined Professor Laurent Pilon's research group at the University of California, Los Angeles, as a postdoctoral scholar. At UCLA, Dr. Marszewski focused on the development of novel methods for the synthesis of thermally insulating and transparent mesoporous materials for window applications. To date, his work resulted in over 30 peer-reviewed publications and one patent application.

Students in the Marszewski NanoResearch Group will develop novel synthesis paradigms to unlock new and exciting opportunities in the field of nanomaterials. Currently, the group focuses on nanoporous materials made of metal oxides, metals, semiconductors, and other

interesting inorganics. Nanopores are pores with sizes less than 100 nm (10,000x smaller than the width of a human hair) that provide extremely large internal surface area and pore volume. Just one teaspoon of nanoporous material can pack a surface area of the same size as a whole football field. As a result, nanopores greatly enhance performance of materials in applications involving material's surface. The target applications will include: (i) production of green fuels by catalytic or photocatalytic conversion of CO_2 and CO , (ii) production of H_2 by photocatalytic splitting of H_2O , (iii) capture and storage of CO_2 and H_2 in porous adsorbents, and (iv) energy storage in batteries and supercapacitors.



Emily Dzurka

joined the department in fall 2021 as visiting assistant professor. Emily received her B.S. in chemistry in 2017 at Saginaw

Valley State University and received her Ph.D. in 2022 from Michigan State University, specializing in total synthesis of natural products as well as synthetic methodology development with a primary focus on mechanistic analysis using NMR kinetic studies. She previously worked at Dow Inc. in a high-throughput discovery research group (Core R&D), where she was exposed to a variety of chemistry projects and applications.



Eamon King

was officially hired as Scientific Glassblower in fall 2021. Eamon has almost 20 years of experience in glass artistry and fabrication in the

Toledo area and at The Toledo Museum of Art. He received bachelor's and master's degrees at UToledo. His M.L.S. degree was performed under the guidance of former UToledo glassblower Steve Moder. Eamon previously served as an apprentice, for more than a year, in the UToledo Glass Shop.

Stephanie

Wood joined the department in spring 2021 as Administrative Assistant I. Stephanie earned her B.S. in Marketing in 2015 and M.B.A. in 2017 from Indiana State University.



Charlene Hansen,

Administrative Secretary 2, retired on October 30, 2020, after almost 31 years of service to the University. We wish her well in her retirement and will miss her experience and talents.



CONDOLENCES



Our colleague, friend, teacher and mentor, **Robert J. Niedzielski**, passed away on November 8, 2021, due to complications

from pneumonia. Bob joined the faculty at The University of Toledo in 1965 as an Assistant Professor. He was promoted to Associate Professor in 1969 and Professor in 1975. Throughout his career he impacted thousands of students teaching general chemistry

and specialized classes in inorganic chemistry. Bob was a respected and valued leader serving the university in a number of key administrative roles, including Acting Chair in chemistry, Associate Dean in the College of Arts and Sciences and Associate Vice

President of Academic Affairs. He retired in 1993 and continued to teach as a Superannuate for seven years. He also remained active in many university and community activities, including as co-editor of this newsletter and a committed volunteer to numerous organizations. A link to his obituary can be found at: www.legacy.com/us/obituaries/toledoblade/name/robert-niedzielski-obituary?id=31556272.

Daniel C. Finnen, (M.S. '90, Funk; Ph.D. '98, Pinkerton) passed away suddenly on Friday, October 8, 2021, in

Cleveland, Ohio. Dan received his M.S. and Ph.D. degrees studying structural aspects of complexes related to biochemistry and inorganic materials. He also earned an M.B.A. from the University of Toledo. After graduation Dan served as a visiting assistant professor at UToledo from 2000-2001 before moving to teach at Shawnee State University in Portsmouth, Ohio, from where he recently retired.

Bruce S. Levison, (B.S. '81) passed away Tuesday, April 7, 2020. After graduation from UToledo, Bruce went

to Case Western Reserve University and earned his Ph.D. in Organic Chemistry in 1986 and then performed postdoctoral work in Pharmacology in 1988. His career spanned many positions in research laboratories and academia focusing on investigations with medical relevance. Most recently he worked at the UToledo Health Sciences Campus on health-related projects and was a collaborator with current faculty in the chemistry department.

IN THE NEWS

Trailblazing Chemist Who Served Alma Mater Passes

By Vicki Kroll, August 2020, used with permission

Dr. Nina I. McClelland, a renowned environmental scientist who championed safe drinking water around the globe and returned to teach and lead at The University of Toledo, died Aug. 16. The Toledo resident was 90.

“Dr. McClelland was an outstanding alumna of The University of Toledo and trailblazer for women in science,” Dr. John Plenefisch, interim dean of the College of Natural Sciences and Mathematics, said. “Her lifelong efforts setting high standards for water quality and the environment have truly made the world a better place.”

McClelland, who earned a bachelor's degree in biology in 1951 and a master's degree in chemistry in 1963 from UToledo, was recognized globally as one of the most influential people in environmental science. She served as chair, president and chief executive officer during her more than 30 years with NSF International, formally National Sanitation Foundation, an independent, not-for-profit organization dedicated to certifying products and writing standards for food, water and consumer goods.

As former chair of the American Chemical Society, the world's largest scientific organization, McClelland developed a Water Quality Index to report water quality in lakes, rivers and streams. In time, states and water authorities were required to annually report water quality to Congress using the index. After the Safe Drinking Water Act was passed, she developed a standard adopted by the government regarding chemicals used to treat drinking water, as well as one covering all products that come in contact with drinking water via its treatment, storage and distribution.

When she retired in 1995 from NSF International, she formed a consulting firm whose clients included the World Bank.

McClelland was a principal and consultant with the International Clean Water program, dedicated to providing healthcare, safe drinking water and food, education, disease control, and other essentials to those in developing countries. She also served on the National Academy of Sciences Committee on Water Treatment Chemicals and for three terms on the Environmental Protection Agency's National Drinking Water Advisory Council.

Safe drinking water was an issue close to her heart. In a 2016 interview, she said, “...safe drinking water from an adequate source through treatment and distribution has always been my



Pictured: Dr. Nina McClelland with new equipment in her namesake Laboratory for Water Chemistry and Environmental Analysis.

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strength and passion.”

That passion began with her first job as a chemist and bacteriologist in the Department of Health at the Wastewater Reclamation Facility in the city of Toledo. After five years, she was named chief chemist, a position she held from 1956 to 1963. She became the first woman in Ohio to earn a Class A license for wastewater treatment.

After receiving a master of public health degree and a doctorate from the University of Michigan in 1964 and 1968, respectively, McClelland joined NSF International in Ann Arbor.

During her career, McClelland served on several major committees, including the National Institute of Standards and Technology in the U.S. Department of Commerce, the National Drinking Water Advisory Council in the U.S. Environmental Protection Agency, and the Committee on Water Treatment Chemicals in the National Academy of Sciences’ National Research Council.

In 2003, McClelland returned to the Glass City and her alma mater as an adjunct professor in the Department of Chemistry. Five years later, she was tapped to serve as dean of the College of Arts and Sciences. She retired from the University in 2011 after working in the Office of the Provost. The dean emerita and professor emerita also served as executive-in-residence in the College of Business and Innovation.

McClelland was awarded an honorary doctorate in science by the University in 2003, and in 2014 received the UToledo Alumni Association’s Gold T in recognition of her outstanding career accomplishments. In addition, she was the recipient of the Outstanding Alumna Award from the Department of Chemistry in 1993 and the College of Arts and Sciences in 2004, and the University Women’s Commission’s Alice H. Skeens Outstanding Woman Award in 2017. And she was featured in the 2004 book titled “Nine UT Alumni Who Changed the World.”

Her many honors include induction into the Ohio Women’s Hall of Fame in 2010 and the National Wildlife Federation’s 2016 Women in Conservation Award, which she received for protecting safe water around the world, promoting clean energy, and preserving wildlife and habitats in Ohio. She also was named a Fellow by the American Chemical Society in 2011 and was recognized as a Legend of Environmental Chemistry by the organization.

Last year, the Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis was dedicated in the UToledo College of Natural Sciences and Mathematics. Located in Bowman-Oddy Laboratories, the lab features state-of-the-art equipment, including novel extraction and microextraction technology and high-resolution mass spectrometry, tandem mass spectrometry, and an advanced imaging system.

“Nina was a tremendous friend and supporter of the College of Natural Sciences and Mathematics and her beloved University of Toledo,” Plenefisch said. “She will be greatly missed, but her legacy will live on at the University through the students

and the research being performed in the Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis in the Department of Chemistry and Biochemistry. She loved our students and was always encouraging them to seek their full potential.”

Support toward the Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis can be made through The University of Toledo Foundation.

Additional articles about the passing of Dr. Nina McClelland: The Wall Street Journal: <https://www.wsj.com/articles/chemist-worked-for-cleaner-drinking-water-world-wide-11598018402>

The Blade: <https://www.toledoblade.com/news/deaths/2020/08/17/nina-mcclelland-famous-ut-educated-scientist-dies-at-90/stories/20200817122>

NSF: <https://www.nsf.org/news/nsf-remembers-nina-mcclelland>

Researchers Conduct Testing for U.S. Navy-funded Hypersonic Aerospace Project

By Christine Billau, February 2021, used with permission

A multidisciplinary group of researchers at The University of Toledo is collaborating with an industry partner on a project to help the nation’s military.

The UToledo team is developing hot, non-vitiated air for hypersonic testing. Non-vitiated air is essentially a gas with all of the properties of air, but without other matter such as particulates or pollutants.

The Office of Naval Research awarded Teledyne Brown Engineering based in Huntsville, Ala., a contract for an aerospace project, with UToledo as a subcontractor. The 10-month contract to UToledo is for \$652,840.

“We’re proud to work with our industry partner on this critical project and pave the way for more collaboration with Teledyne,” said Dr. Steven Huebner, research professor of mechanical, industrial and manufacturing engineering and executive director of the UToledo Institute of Applied Engineering Research.

The research effort at UToledo involves professors in the College of Engineering and the College of Natural Sciences and Mathematics, including Huebner; Dr. Mark Mason, professor of chemistry and biochemistry; Dr. Ana Alba-Rubio, assistant professor of chemical engineering; and Dr. Sorin Cioc, clinical associate professor of mechanical, industrial and manufacturing engineering.

The UToledo team has been working on the project since last summer. Testing is scheduled to begin this month in a high-pressure laboratory on campus.

“I am pleased that our faculty members in the College of Engineering and Department of Chemistry and Biochemistry have been able to provide strong support for this Office of Naval Research project led by Teledyne in hypersonics, an

area of tremendous importance for our national leadership in aerospace,” said Dr. Frank Calzonetti, UToledo vice president of research. “The strong support of Rep. Marcy Kaptur helped provide the Office of Naval Research with funds needed for this project.”

UToledo Chemists Identify Toxic Chemicals in Fracking Wastewater

By Christine Billau, May 2020, used with permission

Before water produced during hydraulic fracturing is disposed of in waterways or reused in agriculture and other industries, chemists at The University of Toledo are zeroing in on water quality and environmental concerns of fracking wastewater to determine if it is safe for reuse.

The research scientists of the new Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis at UToledo created a new method that simultaneously identified 201 chemical compounds in fracking wastewater, called produced water.

The research, which is published in the *Journal of Separation Science* and was carried out in collaboration with scientists at the University of Texas at Arlington, shows that many of the chemicals found in produced water are carcinogens, solvents and petroleum distillates that can directly contaminate drinking water sources.

“The issue with produced water is that this is a very new and overlooked source of pollution, and disposal and purification practices are not yet fully optimized to guarantee total removal of environmental pollutants,” said Dr. Emanuela Gionfriddo, assistant professor of analytical chemistry in the UToledo Department of Chemistry and Biochemistry, and the School of Green Chemistry and Engineering. “Our work aimed to provide a new, simple and cost-effective method for the comprehensive characterization of chemicals and fill the gap of knowledge currently existing about the chemical composition of this waste product of the oil and natural gas industry.”

Scientists and natural gas companies are seeking creative ways to use produced water because current treatment processes to remove salts and radioactive substances — processes that include reverse osmosis and distillation — are expensive.

“Current methods for chemical characterization of produced water can give an estimate of the total amount of contamination, but do not give information about what type of contamination is present,” Gionfriddo said. “It could be that a molecule can be still very toxic even if present at very low concentration, or it has the potential to accumulate in the body over time, so the point is to know exactly what is in produced water, not only how much.”

Gionfriddo’s research outlines how the chemists developed and optimized a thin-film, solid-phase microextraction approach to characterize the organic compounds in the produced water.

The team identified many chemicals, including a pesticide called atrazine; 1,4-dioxane, an organic compound that is irritating to the eyes and respiratory tract; toluene, which at low exposure has health effects like confusion, weakness, and loss of vision and hearing; and polycyclic aromatic hydrocarbons, which have been linked to skin, lung, bladder, liver and stomach cancers.

“There are many chemicals that still need to be identified at this time,” said Ronald Emmons, UToledo Ph.D. candidate. “More research also is needed to test the uptake of these chemicals in crops when produced water is recycled for agriculture. We need to study if and how these chemicals from the produced water can accumulate in the soil watered with produced water and if these chemicals can transfer from the soil to the crops.”

The collaborative research between UToledo and UT Arlington will continue using the new method for screening the presence of toxic molecules in produced water samples from various sampling sites in Texas.

UToledo scientists also are developing new methods for the extraction of heavy metals and rare earth elements that will aid the full characterization of produced water samples.



Dr. Emanuela Gionfriddo (right), assistant professor of analytical chemistry, and Ronald Emmons (left), UToledo Ph.D. candidate, are studying water quality and environmental concerns of fracking wastewater to determine if it is safe for reuse.

A second article on the analysis of produced water by **Ronnie Emmons** (Ph.D. student, Gionfriddo) and **Govind Sharma Shyam Sunder** (Ph.D. '21, Kirchhoff) was highlighted by the National Science Foundation, https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=304669&org=NSF&from=news, among many other news outlets across the country. The article, *Unraveling the Complex Composition of Produced Water by Specialized Extraction Methodologies*, was published in *Environmental Science & Technology* in January 2022.

AWARDS/SCHOLARSHIPS

The following awards and scholarships were presented at the spring 2020, 2021 and 2022 Honors Tea Ceremonies:

Alfred F. Foster Health Science Award

Jessica Bennett (Fall 2019)
Ashlyn Monnin (Spring 2020)
Emma Siefker (Fall 2020)
Makaya Smith (Spring 2021)
Allison Sherman (Fall 2021)
Clara Otting (Spring 2022)

Analytical Chemistry Award

Allison Boyer (2020)
Ashley Scheutzow (2021)
Jonathon Truong (2022)

Arthur H. Black Award in Analytical Chemistry

Veronica Martin (2020)
Collin Reimer and Leo Roberts (2021)
Beth Ziegelmeyer and Chloe McLeod (2022)

Arthur H. and Virginia R. Black Merit Scholarship

Gracie Siffer (2020)
Samuel Simpson (2021)
Margaret Hannah (2022)

Biochemistry Award

Nathan Gembreska (2020)
Michelle Huynh (2021)
Jonathon Truong (2022)

Bodo Diehn Undergraduate Award

Nicole Usserman (2020, 2021 and 2022)

Chemical and Allied Industries of Northwest Ohio (CAI-NWO) Scholarship

Cole Shoults (2020)
Ashley Scheutzow (2021)
Jonathon Truong (2022)

Chemistry Faculty Scholarship

Dr. Alfred F. Foster Scholar
Samuel Simpson (2020)

Dr. John Chrysochoos Scholar
Michael Hilyard (2021)

Dr. Robert Niedzielski Scholar
Bella Walter (2022)

CRC Press Freshman Chemistry Achievement Award

Odinakachukwu Okwenne (2020)
Esha Kashaboina (2021)
Ela Verhoff and Logan Urbanyi (2022)

CV Wolfe Scholarship in Natural Sciences

Cecile Schreidah (2020)
Alice Ou (2021)
Mary Eby (2022)

David Dollimore Award in Chemistry

Michael Hilyard (2020)
Paige Wlodkowski (2021)
Ernest Wolke (2022)

David R. Hostetler Memorial Scholarship

Gillian Miller (2020)
Carmen Rhinehalt (2021)
Alexandra Simpson (2022)

Henry R. Kreider Scholarship in Chemistry

Nathan Gembreska, Alexander Vogel and Isabella Walter (2020)
Michelle Huynh, Leo Roberts and Isabella Walter (2021)

Megan McGuiness, Anthony Pham and Paige Wlodkowski (2022)

Inorganic Chemistry Award

Joyce Stupka (2020)
Samuel Simpson and Beth Ziegelmeyer (2021)
Chloe McLeod and Dylan Nelson (2022)

James E. and Margaret M. Sander Scholarship in Chemistry

Benjamin Netry (2020)
Gracie Siffer (2021)
Carmen Rhinehalt (2022)

Joseph A. and Mary A. Capobianco Memorial Scholarship

Eve Sroczynski (2020)

Zachary Turner (2021)
Chloe McLeod (2022)

Organic Chemistry Award

Michelle Huynh (2020)
Aaron Ellis (2021)
Mark Marusak (2022)

Organic Progress Fund Graduate Student Award

Fan Wu (2020)
Pratibha Kumari Chand-Thakuri (2021)
Navdeep Kaur (2022)

Outstanding First-Year Graduate Student/Ramachandran and Potlapally Graduate Award

Mathieu Geremia (2020)
Abigail Olomukoro (2021)
Alex Nguyen (2022)

Outstanding Graduating Senior

Veronica Martin (2020)
Nathan Gembreska (2021)
Beth Ziegelmeyer (2022)

Outstanding Graduate Student Research Paper of the Year

Kasun Ratnayake (2020)
Yeakub Zaker (2021)
Govind Sharma Shyam Sunder (2022)

Outstanding Teaching Assistant

Heidi Fresenius and Navdeep Kaur (2020)
Abigail Gohmann and Adedapo Olosunde (2021)
Shawn Allen and Prem Gurung (2022)

Physical Chemistry Award

Collin Reimer (2020)
Michael Hilyard and Beth Ziegelmeyer (2021)
Zachary Turner (2022)

William B. Silverman Scholarship in Chemistry

Collin Reimer (2020)
Nathan Walker (2021)
Raegan Philips (2022)

DEPARTMENT HIGHLIGHTS

GRANT\$\$

Emanuela Gionfriddo

received funding from the Ohio Sea Grant College Program for her project *On-site and in laboratory quantitative analysis of pharmaceuticals and PFAS in fish by solid-phase microextraction technology coupled to mass spectrometry*. The project award period is February 1, 2020, through January 31, 2022, in the amount of \$119,925. She also became the 9th CAREER Award recipient from the department and the 3rd CAREER Award recipient in the department this fiscal year. Her project *CAREER: Understanding Molecular Mechanisms Underlying Chemical Behavior of Pollutants in Heterogeneous Environmental Systems* is a five-year grant for \$756,354 and begins April 1, 2022. Additionally, Emanuela was co-investigator on a URFO Interdisciplinary Research Initiation Award for \$16,000 with Song Qian, Department of Environmental Sciences, for the project titled *An Interdisciplinary Approach of Reducing Measurement Uncertainty of (Almost) All Chemicals*. She also received a URFO Award for \$1,000 through the small awards program to support the Summer 2022 ACS Project SEED Program.

Matt Wohlever

received an NIH MIRA Award (R35) for his project *Mechanistic Investigation of Proteostasis at the Outer Mitochondrial Membrane*. The project was awarded for five years with total funding of \$1,881,250. Additionally, he became the 8th NSF CAREER Award recipient from the department for his project *CAREER: The Effects of Liquid-Liquid Phase Separation on Ubiquitin Chaperone and Triage Activity*. The five-year project funded for \$1,088,389 began December 1, 2021, and will run through November 30, 2026. He also received a supplemental equipment award of \$176,765 to obtain a Mosquito LCP Robot.

Mike Young

received two awards. The first was an NSF CAREER Award for his project *CAREER: Expanding the Toolbox for Olefin Functionalization and Difunctionalization*

Reactions. The five-year award began August 1, 2021, and totals \$648,553. Second, a URAF award for \$18,000 for his project *Activation and Fixation of Carbon Dioxide Using Infrared Radiation* was received.

John Bellizzi

received funding for his NIH R15 grant application titled *Discovery and Characterization of Novel Halogenases from the Human Microbiome*. The three-year award of \$424,735 will run from September 15, 2021, to August 31, 2024. He also received a URFO award for \$15,000 for his project *Identification and Characterization of Novel Halogenating Biocatalysts*.

Wei Li

received an NIH R15 award titled *Regio- and Enantioselective Alkene Difunctionalization for the Synthesis of Bioactive Molecules*. The grant began September 1, 2020, and will continue for three years to August 31, 2023. The amount of the award was \$451,500. He also received a URFO Award of \$15,000 for his project *Accelerated Pharmaceutical Synthesis via Regio- and Enantioselective Alkene Difunctionalizations*.

Ajith Karunarathne (PI) and Steve Sucheck (co-PI)

were awarded \$939,848 for their NIH R01 proposal titled *Optical Control of Endogenous G Protein Coupled Receptor and G Protein Signaling*. The grant will run for three-years, and the main goal is to develop photoligands for *in vivo* applications. **Ajith** also received a supplemental equipment award of \$90,644 to enhance his imaging system with an additional laser engine and two new cameras to expand its capability to perform new and novel experiments.

Cora Lind-Kovacs

received a subcontract awarded through the US Department of Energy's Argonne National Lab for a collaboration with lead battery manufacturers to improve battery cycling efficiency. Funding for the two-year project is from the American

Battery Research Group, which includes five companies: EnerSys (Reading, PA), RSR Technologies (Dallas, TX), East Penn Manufacturing (Lyon Station, PA), Crown Battery (Fremont, OH) and Clarios (Milwaukee, WI). Her project titled *Molecular Design of Lead Acid Battery Model Expanders* was funded for \$271,911 from June 2021 through May 2022. A second year is expected for this award.

Mark Mason

is part of a multidisciplinary project funded through the Office of Naval Research involving UToledo faculty in NSM and Engineering along with Teledyne as an industrial partner. The focus of the project is to develop hot, non-vitiated air for hypersonic testing. The 10-month contract to UToledo is for \$652,840. He also received a University Research and Fellowships Program Award for \$9,000 for his project titled *Cationic Complexes of Aluminum for Activation of Small Molecules and Asymmetric Catalysis*.

Dragan Isailovic

received two grants from the Ohio Department of Higher Education (ODHE) Harmful Algal Bloom Initiative. First, \$189,176 for his grant application titled *Discovery of Novel Cyanotoxins in HAB samples from Lake Erie and Maumee River and Investigation of their Toxicity*. Second, \$145,166 for his grant application titled *Development of Corn-cob-based Materials and Filters for Removal of Cyanotoxins from Water*. Both grants will run from July 1, 2021, to December 31, 2023.

Xiche Hu, Ron Viola,

Liram Shemshedini, and Issac Schiefer were awarded a URFO Interdisciplinary Research Initiation grant for \$40,000 for their collaborative project *Peptides Inhibiting EZH2 and AR in Prostate Cancer Cells*.

Kristin Kirschbaum

and the SCOPE team were awarded funding for their proposal titled *Expanding the SCOPE of Science Classes through Cyber-Enabled Instrumentation* through the American Society of Cell Biology for \$33,396.

Department Highlights, continued from page 7

Peter Andreana

received a URFO Small Grant for the organization of the program *GRC – Mentoring Young Carbohydrate Scientists for Future Success* at the Gordon Research Conference in Holderness, New Hampshire, in June 2021. He also received a \$30,000 supplement to his NIH funded project *Novel Methods and Technologies*

for *Synthesis of Biomedically Relevant Carbohydrates*.

Joe Schmidt

was awarded a URAF award of \$10,000 for his project *New Lanthanum-Centered Catalysts for Atom Efficient Syntheses*. He also received a URFO Small Grant Award for \$900 for his project *Reactivity Trends Among the Lanthanide Elements*.

Steven Sucheck

received a URFO Small Grant for the organization of the International Conference for Advances in Glycan Engineering and Glycans from the Microbial World at Pacificchem 2021 in Honolulu, Hawaii, in December 2021.

APPOINTMENTS

Emanuela Gionfriddo

currently serves as Secretary on the Executive Committee of the Analytical Chemistry Subdivision of the American Chemical Society on Chromatography and Chemical Separations. Her two-year term began on October 1, 2020. Emanuela was also appointed to a seat on Ohio Attorney General Yost's Environmental Council of Advisors, appointed to the advisory editorial boards of two Elsevier journals, *Green Analytical Chemistry* and *Advances in Sample Preparation*, and was named to the Local Organizing Committee of the 45th International Symposium on Capillary Chromatography & the 18th GCxGC

Symposium that was held in Fort Worth, Texas, from May 9-14, 2021.

Ajith Karunarathne

was granted tenure and promoted to Associate Professor at the April 2020 Board of Trustees meeting.

Wei Li and Mike Young

received tenure and promotion to Associate Professor at the April 2021 Board of Trustees meeting.

Cora Lind-Kovacs

was elected to the International Union of Crystallography Commission for Powder Diffraction. She was also

elected Vice President of the American Crystallographic Association for 2022 and will then serve as President in 2023 and Past President in 2024.

Steve Sucheck

was appointed to the leadership team of the American Chemical Society Division of Carbohydrate Chemistry as chair elect for 2020-2022, Chair for 2022-2024 and Past Chair for 2024-2026.

Amy Toole

was promoted to Associate Lecturer beginning Fall 2021.

HONORS, AWARDS AND RECOGNITION

FACULTY/STAFF



Kristi Mock

Associate Lecturer, was named as one of the recipients of the 2019-2020 University of Toledo Outstanding Teacher Award.

Kristi is the 9th chemistry faculty member and one of three current faculty to receive this prestigious university wide award.

Wei Li

was named a 2020 recipient of the Thieme Chemistry Journals Award. The Thieme Chemistry Journals Award was established in 1999 to encourage and recognize the potential of young research scientists in synthetic organic chemistry.

The editorial board of the journals *Synthesis*, *Synlett* and *Synfacts* selected the awardees.

Amy Toole, Peter Andreana and Terry Bigioni

were recognized in the "Shout Out" for *Innovative Instructors and Staff* campaign initiated by the Provost Office in the Fall 2020. **John Bellizzi** and **Kristi Mock** received recognition from students during for the spring 2021 semester and **Amy Toole, Kristi Mock** and graduate student **Noah Peterson** were recognized during fall 2021. The "Shout Out" for Innovative Instructors and Staff campaign by the Office of the Provost provided students with the opportunity to highlight

instructors and staff who have positively impacted their well-being, success or sense of community.

Emanuela Gionfriddo

was interviewed as part of a series called Rising Stars in Separation Science. The interview was published in the September Europe and Asia issue of *The Column*, which is published by *LC/GC*. The link to the published interview is: <https://bit.ly/3w9sr59>

Ajith Karunarathne

was one of 26 faculty who received the 2021 President's Awards for Excellence in Creative and Scholarly Activity and **Steve Sucheck** and **Jianglong Zhu** received 2021 President's Awards for Excellence in Grantsmanship.

The UToledo Board of Trustees approved **Peter Andreana's** sabbatical leave for Fall 2021 to *Develop Recombinant Technology Methods and Protocols for "Nano-Antibody" Production (Camelid Antibodies)*.

Ajith Karunarathne's

recipe for hand sanitizer was included in an article by the Huffington Post: <https://bit.ly/3MLxGxU>

Three Chemistry and Biochemistry Faculty were selected by the Provost Office as Equity Champions with the APLU Student Experience Project (SEP). **Amy Toole, Kristi Mock and Lisa Zhurova** were selected as three of the six faculty from the college.

Beginning Summer 2020, Amy, Kristi and Lisa worked to implement and test change ideas in the classroom that will promote equity and a sense of belonging, STEM self-efficacy and identity for historically underserved students at the University of Toledo. They represent UToledo in a national collaborative of university leaders, faculty, researchers and education and improvement organizations committed to increasing equity in higher education by improving the student experience. The peer institutions in the project include Colorado State University, Portland State University, The University of New Mexico, University of Colorado Denver and University of North Carolina at Charlotte, with support from the Raikes Foundation, APLU and the Coalition of Urban Serving Universities).

Chemical Storekeepers, **Stephanie Kaetzel and Tony Kaminiski,**

were selected by UToledo's Office of Environmental Health and Radiation Safety to attend emergency response training at The Center for Domestic Preparedness at the Anniston Army Depot in Anniston, Alabama. The Center for Domestic Preparedness is operated by the United States Department of Homeland Security's Federal Emergency Management Agency and the only federally chartered weapons of mass destruction training facility in the nation. During their week-long training programs in Fall 2021, Stephanie and Tony developed advanced skills and practical

training to respond to local incidents involving hazardous materials. At the end of the week they were certified in Hazardous Materials Operations and brought critical knowledge back to the university and department operations.



The following employees received their service recognition awards in 2019:

5 years: **Ajith Karunarathne**

15 years: **Joseph Schmidt**

20 years: **Elizabeth Zhurova**

2020:

5 years: **Wei Li**

10 years: **Jianglong Zhu**

15 years: **Tony Kaminski** and **Steve Sucheck**

20 years: **Stephanie Kaetzel** and **Tim Mueser**

25 years: **Yong Wah Kim**

30 years: **Charles Davis** and **Tom Kina**

2021:

5 years: **Michael Young**

15 years: **Terry Bigioni, Claire Cohen-Fray** and **Vladimir Zhurov**

35 years: **Pam Samples**

Going for the Gold!

Cora Lind-Kovacs

competed in the North American Championships and USA Qualifiers for Taekwon-Do in Houston, Texas, March 19-20, 2022. She brought home gold medals in Women's 4th Degree Patterns and Senior Women's (36+ yrs) Sparring and will be representing Team USA in 4th Degree Senior Women's Patterns and



Senior Women's Heavyweight Sparring at the 2022 International Taekwon-Do Federation World Championships in Amsterdam, Netherlands, July 26-31, 2022.

STUDENTS

Victoria Drago

(Ph.D. '22, Mueser) is conducting research showing that microgravity produces high-quality protein crystals that can be analyzed to identify possible targets for drugs to treat disease. Astronauts on the International Space Station will check the crystals, report on their growth and then make changes based on initial observations.

Ronnie Emmons

(Ph.D. student, Gionfriddo) was awarded a 2022 ACS Division of Analytical Chemistry (DAC) Summer Graduate Fellowship sponsored by Pittcon. DAC Graduate Fellowships are very prestigious and recognize only a few of the top analytical graduate students in the country each year.

Mollie Enright

(Ph.D. student, Mason) received a student travel grant from the ACS Green Chemistry Institute Pharmaceutical Roundtable to support travel to the 2022 ACS Green Chemistry and Engineering Conference or another conference sponsored by the American Chemical Society. The award will enable Mollie to present her work, as well as some of the results generated by

Christine Jette (M.S. '21), on iron-catalyzed cross-coupling of heterocycles.

Nathan Gembreska

was named the 2020-2021 Outstanding Graduating Student in the Department of Chemistry and Biochemistry and the **Outstanding Graduating Senior** in the College of Natural Sciences and **Mathematics**. He was selected from the five outstanding graduates from each department in the college.



Honors, Awards and Recognition, continued from page 9

Navdeep Kaur

(Ph.D. '22, Li) was awarded a GSA Graduate Research Award for Academic Year 2021-2022. Funds in the amount of \$2,000 were awarded for her proposal *Concise Synthesis of Plavix (clopidogrel) Variants for Patients Lacking Metabolizers*.

Vinod Landge (postdoctoral associate, Young) was an inaugural recipient of the Nina McClelland Memorial Award for excellence in green chemistry research by a postdoctoral scholar. The award of \$2000 was provided to allow Vinod to attend and present his research at the Green Chemistry and Engineering Conference in Reston, Va., June 6-8, 2022.

Abiral Poudel

(Ph.D. student, Kirchhoff) and **Govind Sharma Shyam Sunder** (Ph.D. '21, Kirchhoff) received Toledo Local Section Travel Awards of \$200 to attend the Pittsburgh Conference and Exposition in Chicago, Ill., in early March 2020, to present their doctoral research.

Yasmin Rina

(Ph.D. student, Schmidt) received a \$2,000 Graduate Student Association Research Award to support her doctoral research.

Mithila Tennakoon

(Ph.D. '22, Karunaratne) received a third-place award at MUACC 2021 at Ohio State University on October 15-17, 2021, for her poster titled *G protein C-tail drives prenylation efficacy and statin sensitivity*.

Abigail Olomukoro

(Ph.D. student, Gionfriddo) was awarded the ANACHEM Student Award for outstanding student paper presented at the morning session for her talk *Ion Exchange Solid Phase Microextraction coupled to Liquid Chromatography/Laminar Flow Tandem Mass Spectrometry for the Determination of Perfluoroalkyl Substances in Water Samples* and **Ronald Emmons** (Ph.D. student, Gionfriddo) was awarded the ANACHEM Student Award for outstanding student paper presented at the afternoon session for his talk *Alternative Extraction Techniques for Produced Water: A Holistic View of Organic Solubles and Elemental Species*. The ANACHEM Symposium was held at the Burton Manor in Livonia, Mich., on November 11, 2021.

Department Institutes Acetone Recycling Program



Chemical use is ubiquitous in research and teaching labs and creates a challenging problem for the disposal of used materials. Acetone is one solvent that

is used in large quantities in the organic teaching and research laboratories for rinsing and cleaning glassware. Chemical Storekeeper II **Stephanie Kaetzel** (pictured right) recognized the

amount of acetone used and eventually requiring disposal was a significant drain on department and university budgets and was not an environmentally sound practice.

In 2020, she secured grant support from the Student Green Fund, the College of Natural Sciences and Mathematics, and Environmental Health and Radiation Safety to initiate an acetone recycling program. The funds were used to purchase the ISTpure Solvent Recycler SR30-30V from International Surface Technologies Inc. of Quebec, Canada. The ISTpure has a working capacity of 30 L with a recovery rate of at least 90 percent in a four-to-six-hour period. This system also will allow future expansion to many common solvents.

The impact has been a significant

reduction in both the cost of chemicals needed for teaching laboratories and the cost of hazardous waste disposal by the university. In the first semester of the program, 420 liters of acetone were recycled saving the department \$1000-1200 in purchase costs and reducing the waste stream saving the university disposal costs of at least two 55-gallon drums (~\$1000-2000). The program is not only benefiting the environment but also helps keep student labs fees as low as possible. Through an undergraduate honors research project, **Beth Ziegelmeier** (pictured left), supervised by Stephanie and **Dr. Emanuela Gionfriddo**, is developing new procedures to test the purity of the recycled acetone and optimize the recycling process.

ALUMNI NEWS

WEDDINGS

Maria McAtee-Ford

(M.S.'13, Kirchhoff) married Marshall Eubanks.

Ashlee Bartlett

(Ph.D. student, Mason) married John Niese on July 31, 2021.

BIRTHS

Julie Colin

(M.S. '05, Lind-Kovacs) and Tamas Rauznitz had a baby boy, Leo Morgan Rauznitz, on April 13, 2021.

Vince Kowalski

(M.S. '17, Mason) and wife, Lili, welcomed a 7 lbs. and 7 ounce baby boy, Noah, on January 28, 2020.

Morteza Jandaghi

(Ph.D. '19, Mason) and his wife, Mahsa, welcomed their first son, Levine Sky Jandaghi, in June 2021. Levine was 7 lbs. 7 ounces and 21 inches at birth.

Mike Young

(Associate Professor) and wife, Samantha, welcomed a son, Gavin Rowan Young, in December 2021.

CAREER UPDATES

Nick Richardson

(Ph.D. '97, Davies) now serves as Interim Provost and Vice President for Academic Affairs at Wagner College in Staten Island, N.Y. He joined Wagner College in June 2000 as an assistant professor of chemistry, was promoted to associate professor and tenured in Fall 2006, was promoted to full professor in Fall 2015, and served as Associate Provost for Academic Affairs since 2018.

J. Brad Shotwell

(B.S. '99), Director of Medicinal Chemistry at AbbVie, was recently recognized as an AbbVie Community of Science (ACOS) Fellow for contributions to new small molecule lead discovery for ongoing programs in immunology, oncology, neuroscience and infectious diseases.

Shontell Wright

(M.S. '03, Dollimore) is a Chemistry Reviewer for the Evaluation and Research Staff in the FDA Office of Dietary Supplements Program (ODSP). Her work focuses on reviewing the identity, manufacturing and specification information provided in new dietary ingredient (NDI) notifications, responding to consumer and industry inquiries, assisting with the development of guidance documents, and providing scientific rationales for the development and assessment of FDA's actions related to the safety of dietary supplement products.

Robert Kernstock

(Ph.D. '04, Funk) is the Director of the Immunoassay Laboratory Services at ICON in Whitesboro, N.Y.

Julie Colin

(M.S. '05, Lind-Kovacs) was promoted at Cummins to Technical Advisor in June 2021.

Bingxu Song

(M.S. '05, Mason) accepted a position as Senior Partner, Managing Director of China Centric Associates in Shanghai, China.

Matthew Hertel

(M.S. '08, Schmidt) started a new position as Senior Chemist at International Flavors & Fragrances, Jacksonville, Fla.

Nick Kingsley

(Ph.D. '09, Mason) is the Associate Dean for Research and Graduate Programs for the College of Arts and Sciences at the University of Michigan in Flint, Mich.

Nicholas Amato

(Ph.D. '13, Bryant-Friedrich) is the Associate Director for Biological Science – Bioanalytical at Moderna.

Emily Bernath

(B.S. '14) released her second book, *Broken Lenses Volume 2: Seeing Others' Value in a World of Division*, June 8, 2021. *Broken Lenses, Volume 2* is the sequel to Bernath's *Broken Lenses: Identifying Your Truth in a World of Lies*, which is a look at how people see those around them as God sees them. Emily is an award-winning author of the *Broken Lenses* series and advocate for sexual assault survivors. As a survivor herself, she found her life quickly hitting rock bottom, along with feelings of hopelessness and worthlessness. In being open about her experience, it became apparent to her how many other people experience similar feelings and that she was not alone. Through rediscovering her faith and identity in Christ, Emily has found freedom and healing from the abuse. She desires to help others find that same freedom and healing and embraces each opportunity she gets to do so. Throughout her author journey over the past 5 years, Emily has spoken about her experiences on numerous TV, radio and podcast interviews, and has presented at sexual assault advocacy conferences. Emily serves on the board of Reveal to Heal International, a non-profit dedicated to preventing all forms of child sexual abuse and helping survivors heal from its effects. After she graduated from UToledo, she earned her M.B.A. from the University of Utah. When she's not writing



and advocating, she spends her time tutoring, volunteering with her church's youth group, playing softball or soccer and making latte art.

Tony Bova

(B.S. '14) completed his doctorate in Energy Science and Engineering from the University of Tennessee, May 2021, and was the featured commencement speaker for UToledo's December 2021 graduation ceremonies.

Adam Keith

(Ph.D. '14, Mason) accepted a position as operations manager at Concept Alloys, Inc. in March 2021. Concept Alloys is located in Whitmore Lake, Mich., and specializes in thermocouple wire and specialty metal alloys. Adam previously worked as a senior chemist at Chem Trend in Howell, Mich., for the past six years.

Josh Young

(Ph.D. '15, Kirchhoff) is a Staff Fellow in the Office of Science and Engineering Laboratories at the FDA Center for Devices and Radiological Health. The work focuses on reviewing chemical data provided by medical device manufacturers as part of a submission for approval of a new device, as well as conducting research to better understand the chemical aspects of medical devices to aid the regulatory decision-making process.

Raymond E. West III

(Ph.D. '16, Isailovic) was promoted to the position of Coordinator of the Nolin Lab and Supervisor of the University of Pittsburgh Small Molecule Biomarker Core facility.

Amila Devasurendra

(Ph.D. '17, Kirchhoff) accepted a Scientist III position at BASF in Wyandotte, Mich.

Dilrukshika "Sanjee" Palagama

(Ph.D. '18, Isailovic) is a Scientist I at Cayman Chemical in Ann Arbor, Mich.

Ahmad Rohanifar

(Ph.D. '18, Kirchhoff) accepted a position of Technology Development Module & Integration Yield Engineer at Intel in Hillsboro, Ore. Ahmad focuses on leading scientific research enabling manufacture of innovative device architectures coupled with the realization of these architectures.

Alumni News, continued from page 11

Cecile Petit

(Ph.D. '18, Ronning) is an Upstream Project Manager at BioNTech in Mainz, Germany. She is managing several projects within the bioinformatic/AI department at BioNTech, which are part of BioNTech's efforts in developing cancer vaccines.

Farzana Hossain

(Ph.D. '19, Andreana) earned the 2020 JCC Best Paper Award for the paper titled *Synthesis of Glycoimmunogen Tn-Thr-PS A1 via Hydrazone Bond and Stability Optimization of PS A1 Monosaccharide Mimics under Vaccine Development Conditions* published in the *Journal of Carbohydrate Chemistry* (2020, 39, 107).

Bishwa Raj Bhetuwal

(Ph.D. '20, Zhu) is working as a Synthetic Chemist at Pfizer in Pearl River, N.Y.

David Baliu-Rodriguez

(Ph.D. '21, Isailovic) accepted a postdoctoral researcher position at Lawrence Livermore National Laboratory, (LLNL) in Livermore, Calif. David is working on a project to develop methods to determine the quantity of metabolic products and pathways in different mouse phenotypes after damage to articular cartilage.

Muhammad Hussain

(Ph.D. '21, Viola) accepted a postdoctoral researcher associate position at the Indiana University School of Medicine in Indianapolis, Ind.

Alex Landgraf

(Ph.D. '21, Sucheck) accepted a T32 Postdoctoral fellowship position at Indiana University School of Medicine in Indianapolis, Ind.

Govind Sharma Shyam Sunder

(Ph.D. '21, Kirchhoff) accepted a new position at Waters Corporation in Milford, Mass., as a Systems Qualification Scientist.

NEW ALUMNI (May 2020- May 2022)

B.A.

Aadilah El-Amin
Marieh Hollenback
Monica Wojciechowski

B.S.

Jennah Abuomar
Lindsey Archibeque
Sarah Becker
Kayla Billiard
Audrey Bonds
Allison Boyer
Justine Clark
Deklin Clayton
Jacob Danielson
Jared Doremus
Erin Eickholt
Gabriella Epelman
Zehra Fasih
Megan Fought
Alyssa Garreau
Adam Gaskins
Nathan Gembreska
Aaron Grant
Grace Gretz
Timothy Heiden
Michael Hilyard
Kenneth Jenkins
Alex Joyce
Brandi Kaskel
Sydney Kohler
Sanjay Koka
Rudhasri Lakkuru

Lilyann Lawson
Laurel Leber
Carl Maier
Veronica Martin
Carolina Mather
Kortney McClure
Benjamin Netry
Eric Patterson
Angelo Payzant
Colin Reimer
Ashley Scheutzow
Alexander Sertage
Gracie Siffer
Samuel Simpson
Madisyn Smart
Eve Sroczynski
Luke Stager
Matthew Stojavljevic
Jennifer Thornburg
Corinne Tisher
Alexander Vick
Nathan Walker
Skyler Weber
Alexander Vogel
Elizabeth Ziegelmeyer

M.S.

Brooke Ballis
Troy Brant
Christine Jette
Daria Kucheriavaia
Christina Oval
Hasheena Rajapakshage
Tharuka Ubayasena

Ph.D.

Nur-E Alom
Jeewani Ariyaratna
Md Ashaduzzaman
David Baliu-Rodriguez
Bishwa Bhetuwal
Pratibha Chand-Thakuri
Victoria Drago
Ishani Hettiarachchi
Md Istiak Hossain
Muhammad Hussain
Morteza Jandaghi
Dinesh Kankanamge
Navdeep Kaur
Kristopher Kleski
Kelly Lambright
Alexander Landgraf
Kazi Lingkon
Veronica Livingstone
La'Nese Lovings
Allison Rabon
Kasun Ratnayake
Fatemeh (Yasaman) Saleh
Andhina Satriani
Rippa Sehgal
Govind Sharma Shyam Sunder
Mithila Tennakoon
Rajendr Thakuri
Aravinda Ulluwis Hewage
Yeakub Zaker

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*The department is currently focusing on fundraising initiatives for the **50th Anniversary Doctoral Fellowship Fund** and the **Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis**. Other endowed funds in chemistry available for donations are:*

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THE 2022 DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY HONORS TEA



*Over \$45,000 in scholarships and awards were presented at the 2022 Chemistry Honors Tea Ceremony.
Congratulations to all of these deserving students!*

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