



Hope COLLEGE

CHEMISTRY AND
BIOCHEMISTRY



WINTER 2023 NEWSLETTER

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Hope College
Chemistry Department



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GREETINGS FROM THE CHAIR

Greetings from the Chemistry Department!

I returned from an amazing sabbatical to find a record-breaking entering class of 947 students waiting to register for fall semester. The demand for a Hope education is strong. Hope is in the first tier among the best liberal arts colleges in the nation and is ranked #22 in providing outstanding research opportunities by U.S. News & World Report. Hope is thriving!

The week before classes started, we took 27 students to the ACS meeting in Chicago. It is always exciting to see students come alive presenting their research at their first national meeting. We also hosted our first ever Hope Alumni reception at the ACS meeting, drawing people attending the meeting and living in the area. It was a lot of fun. Our next reception will be held in conjunction with the spring ACS meeting in Indianapolis on March 26th (find more details on the following page).

As the pandemic winds down, I am happy to say that life on campus seems quite normal. We still use some pandemic era technology, like virtual meetings and recorded lectures, but do so for other reasons, such as to improve accessibility. Students have rediscovered hanging out and working together in Schaap, and the student center is typically packed. Students ate over 300 candy canes from the “Chemistree” leading up to finals and there was some evidence of chair racing on the 3rd floor. The campus has its residential college feel back again.

With Donna Sova’s retirement, we have welcomed a new Office Manager, Liz Hinkley. Liz previously worked with Creative Dining Services at Hope. We are excited to have her become part of the team. The spring semester will also reveal all the success of our seniors as they finish up their work at Hope and future opportunities unfold. We are also looking forward to an exciting summer of research.

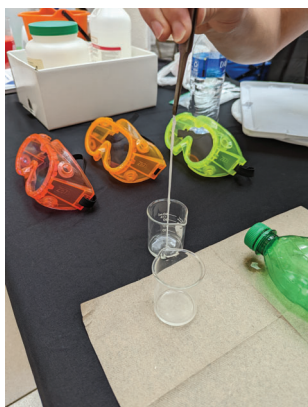
All of our successes as a department are because of you and we are proud to celebrate your accomplishments. Please share them with us by sending us an update, or by dropping by the Science Center to say hello. We are always glad to see you!

Best wishes,



Elizabeth M. Sanford

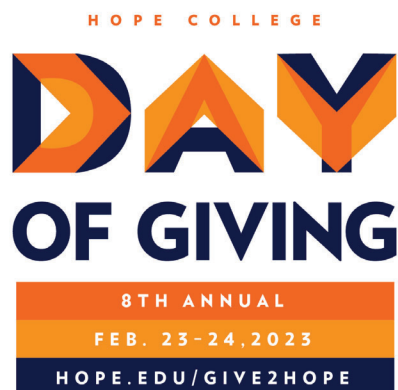
Professor of Chemistry and Chair



*Left and Center: ChemClub members perform chemistry demonstrations at Chemistry at the Mall in October 2022;
Right: Students took some time to explore Chicago landmarks during the ACS National Meeting.*



UPCOMING EVENTS - PLEASE JOIN US!



DAY OF GIVING - FEBRUARY 23 - 24

Just a reminder - You can help support the chemistry department and students by making a gift on the Day of Giving. Save the date: February 23-24.

Give to what you love!

CHEMISTRY MIXER TO BE HELD IN INDIANAPOLIS AT SPRING AMERICAN CHEMICAL SOCIETY MEETING ON SUNDAY, MARCH 23

Are you headed to the Spring 2023 ACS Meeting in Indianapolis or do you live in the Indianapolis area? If so, please join us for a reception on Sunday, March 26 at the Crowne Plaza Indianapolis Downtown (123 W Louisiana St, 46225) from 4-6 PM. To RSVP visit hope.edu/mixing-indy.



Alumni, students and faculty enjoy the reception held at the fall ACS meeting in Chicago.

SCHAAP RESEARCH SYMPOSIUM SCHEDULED FOR JULY 13-14, 2023

We are pleased to announce our third Schaap Chemistry Symposium! The event will be held on July 13 and 14th, 2023, on Hope's campus. The symposium will feature research presentations from Hope College undergraduate researchers, chemists from local industry, and graduate students and postdocs from research universities across the country. Hope's chemistry faculty, friends of the department, and faculty from those same research universities will also be in attendance. Please find details on our [website](#) or contact Jason Gillmore (gillmore@hope.edu) if you are interested in attending.

Alumni – Are you interested in supporting the career exploration of Chemistry and Biochemistry Majors? If so please email discoverwork@hope.edu.



DEPARTMENT UPDATES

NATALIA GONZALEZ-PECH & KELLY RONALD AWARDED INTERDISCIPLINARY NSF GRANT

Adapted from article written by Greg Olgers, Hope College Public Affairs and Marketing



As of 2020, the world has lost an estimated two-thirds of its mammal, bird, reptile and insect populations. This extreme loss of biodiversity is widely considered a sixth mass extinction event. The global bird population is estimated to have declined by 3 billion since the 1970s. The NSF awarded biologist Dr. Kelly Ronald and chemist Dr. Natalia Gonzalez-Pech (*both pictured at left*) more than \$500,000 through a three-year grant for their research seeking to better understand why.

The award supports the interdisciplinary study of how house sparrows are affected by a specific type of air pollution: iron oxide nanoparticles (IONPs) — floating bits of iron generated by the iron and steel industries that are so small that a standard microscope cannot see them.

“The overarching hypothesis is IONPs exposure will disrupt the birds’ behavior by either detrimentally affecting auditory sensory processing and/or through bioaccumulation of nanoparticles,” the two scientists note in their project summary. The research objectives include testing the prediction that IONPs exposure decreases hearing sensitivity, determining whether IONPs exposure alters species-relevant behaviors, and localizing and quantifying the accumulation of IONPs in relevant organs.

The grant that Ronald and Gonzalez-Pech have received is through a new NSF initiative, “Building Research Capacity of New Faculty in Biology (BRC-BIO).” Ronald, who has been studying the impact of human activity on human birds for several years, is an assistant professor of biology. Gonzalez-Pech, whose research focuses on nanoparticles, is an assistant professor of chemistry. Both joined the Hope faculty in 2019. In addition to applying the capabilities of two scientific disciplines and their individual scholarly specializations to the project, Ronald and Gonzalez-Pech have engaged six Hope students on their joint research project.

SCHOLARLY ACCOMPLISHMENTS FROM THE DEPARTMENT

By Kristin Dittenhafer-Reed

In 2022 the faculty of the Chemistry Department continued to secure external funding, present, and publish their research. Nine external grants were awarded totalling nearly \$1.7M. Seven publications were accepted and published in peer-reviewed journals including Peptide Science, the Journal of Chemical Education, Nanomaterials, and Polymer Chemistry. Will Polik led the release of a new version of WebMO. In addition to student presentations highlighted below, faculty presented many invited talks at institutes of higher education, regional meetings, and national meetings. Faculty continued their engagement in professional societies. Notably, Jason Gillmore served on the American Chemical Society Committee on the Petroleum Research Fund, one of only 5 undergraduate faculty on a 30 member advisory board administering \$20M annually in funding. Other accolades include Jeff Johnson’s receipt of the Hope College Vanderbush-Weller Award for going above and beyond in his commitment to students and Meagan Elinski being named as a Hope College Towsley Scholar Finalist.



DEPARTMENT UPDATES

STUDENTS PRESENT AT REGIONAL FALL CONFERENCES

By Meagan Elinski

With the return to in-person conferences continuing to gain momentum, Hope College students have had an especially strong showing at conferences during the Fall 2022 season. Students and faculty mentors from the Chemistry Department and the broader Natural and Applied Sciences Division (NASD) traveled to both regional and national conferences to share their research and promote their work done at Hope – showcasing one of the reasons why Hope was recently ranked 22nd in the nation for undergraduate research by U.S. News & World Report. Across the division upwards of 59 students combined to make 75 presentations at conferences across the country. The conferences include:

American Chemical Society Fall 2022 National Meeting - Chicago, IL (26 NASD, 19 Chemistry)

Gulf Coast Undergraduate Research Symposium - Rice University, Houston, TX (1 NASD)

Michigan Space Grant Consortium Annual Fall Conference - University of Michigan, Ann Arbor, MI (7 NASD, 6 Chemistry)

Neuroscience 2022 with the Society for Neuroscience - San Diego, CA (2 NASD)

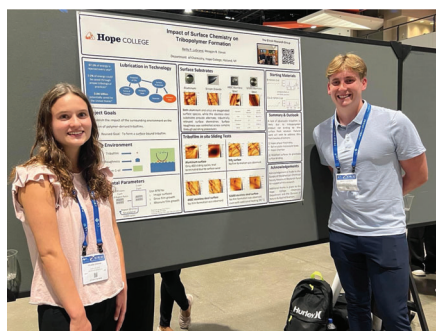
West Michigan Regional Undergraduate Science Research Conference (WMRUGS) - Van Andel Institute, Grand Rapids, MI (19 NASD, 10 Chemistry)

Annual Biomedical Research Conference for Minoritized Scientists - Anaheim, CA (5 NASD, 1 Chemistry)

Midstates Consortium Undergraduate Research Symposium for Physical Sciences, Math, and Computer Science - Washington University, St. Louis, MO (3 NASD, 2 Chemistry)

Midstates Consortium Undergraduate Research Symposium for Biological Sciences and Psychology - University of Chicago (6 NASD, 3 Chemistry)

American Institute of Chemical Engineers 2022 Annual Meeting - Phoenix, AZ (6 NASD, 1 Chemistry)



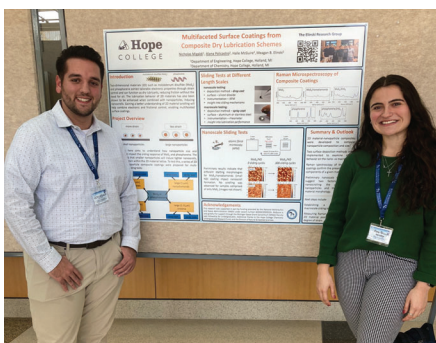
Claire Dwyer and Reilly LaGrand at the ACS meeting



Ryan Erdmann and Emma Rudisel at Midstates



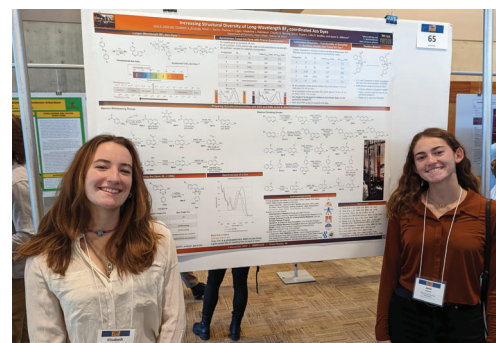
Students attending the Fall ACS meeting in Chicago



Nicky Migaldi and Alana Policastro at MSGC



Students at "The Bean" in Chicago



Eli Arronado and Janie DeGroot at WMRUGS



DEPARTMENT UPDATES

OFFICE MANAGER DONNA SOVA RETIRES AFTER 15 YEARS

By Kristin Dittenhafer-Reed

Donna Sova, our Office Manager, retired in December after serving the Department for 15 years. Donna (*pictured at right*) is well known for her contagious positive attitude, service orientation, and willingness to go above and beyond to support faculty, staff, and our students. A celebration of her retirement was held on December 15. We will miss her greatly and wish her all the best in retirement.



NECKERS LECTURER DR. ANNA MARIE PYLE HIGHLIGHTS FALL SEMINAR SERIES

By Kristin Dittenhafer-Reed

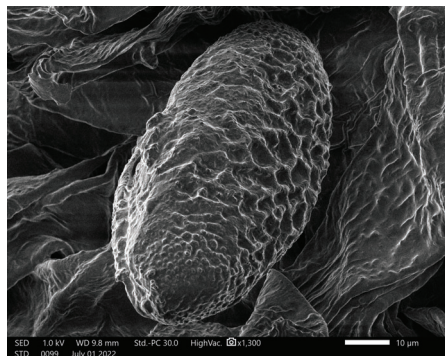
The fall seminar series brought nine chemists to campus from research institutions across the country and local industries. Students and faculty gathered Friday afternoons to learn cutting-edge chemistry occurring in many chemical disciplines from a diverse group of speakers. Students were able to network through lunch and Q&A, while faculty hosted one-on-one meetings with the speakers throughout the day.

A highlight of our seminar series is the lectureship supported by the generosity of James and Jeanette Neckers (class of 1923). This two-day event includes a lecture directed towards the general public and a scientific lecture. We were pleased to have Dr. Anna Marie Pyle, Sterling Professor of Molecular, Cellular and Developmental Biology and Professor of Chemistry at Yale University, as our 2022 Neckers Lecturer. Dr. Pyle's public lecture, "The life of the RNA in Nature and Medicine" highlighted the many functions of RNA and how RNA is being re-engineered into new types of medicines. She followed this talk with a lecture entitled "Visualizing and targeting the unique features of fungal RNA metabolism: the path to a new generation of antifungal therapies" that focused on the critical advances her laboratory has made on understanding RNA splicing, a complex cellular event critical for gene expression.

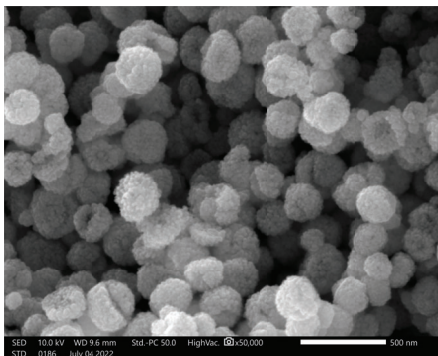


Dr. Anna Marie Pyle, Fall 2022 Neckers Lecturer

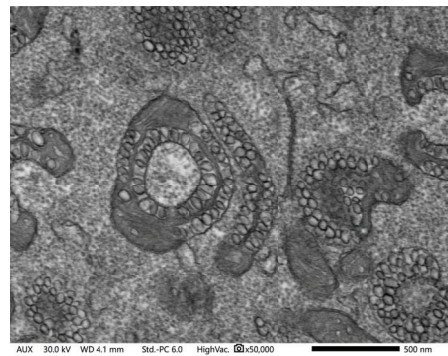
IMAGES FROM RECENTLY INSTALLED SCANNING ELECTRON MICROSCOPE



Pollen



Nanoparticles



Flock House Virus replication complexes forming on mitochondrial membranes

ALUMNI SPOTLIGHT: DR. MARCO TORI '12

By Leah Chase

Last fall, Marco Tori ('12) was named one of Hope College's 2022 "10 under 10 Alumni Award" winners. Tori (*pictured at right*) was a dual chemistry and Spanish major at Hope college who was part of the Michigan State Premedical Early Assurance Program. Following his acceptance into the MSU College of Human Medicine his senior year, Tori elected to spend one year working with the Lutheran Volunteer Corporation as a men's program coordinator at Pioneer Square Transitional Housing in Seattle. In this role, he had the opportunity to work with men experiencing homelessness, an experience that really informed his choice to work with underserved populations throughout his medical school training. After graduating with his doctorate in 2017, Tori moved to Boston to complete a "dream" residency training program at the Boston Medical Center in both



internal and preventative medicine with a focus on primary care for Spanish-speaking individuals. But, when the COVID-19 pandemic began toward the end of this residency program, Tori's career plans changed. He began volunteering in the hospital ward to serve those infected with COVID where he saw the need for more individuals working in public health. Tori said, "I felt like a leader in March of 2020, being one of the few people in the hospital taking care of COVID patients." But, as he saw how many aspects of disease transmission were preventable, he felt called to the field of Public Health. Shortly thereafter he completed a Master's in Epidemiology from Boston University School of Public Health. Tori currently serves as Lieutenant Commander for the U.S. Public Health Service in South Carolina where he holds an applied epidemiology fellowship with the Centers for Disease Control and Prevention Epidemic Intelligence Service. He has deployed with the CDC to serve Afghans after many were repatriated to the United States and to Southern Africa to assist in polio eradication.

Tori is thankful for the mentors that have been instrumental in preparing him for his work as a physician and now in the public health sector. He noted that he honed his ability to focus on the little details while doing research in Dr. Elizabeth Sanford's lab. His project focused on synthesizing novel luminescent monomeric dyes for electrochemistry applications. Tori notes, "I was making molecules that hadn't been made before. But, the big picture of making the dye involved many months of long synthetic reactions. Success came down to the day-to-day individual steps of planning and carrying out each reaction." This is a great metaphor for his current work in public health.

Tori has gone from "studying individual molecules to populations of people." And he admits, "there is a big change in scale." But, there were some great lessons learned in the Sanford lab that helped prepare him for this role. "Many times we couldn't see the individual compounds we made in the synthetic process leading to the final dye." Now, in his role at the CDC, Tori notes, "I don't get to see individual cases of disease, but I can see the impacts of individual behavior at the population level." It comes back to keeping the big picture in mind as you examine all the small steps along the way. Ultimately, he notes, "It all comes down to what perspective you use to view the problem."

Dr. Sanford saw Tori's potential as a servant leader in public health years ago. In writing the letter of recommendation for med school, Sanford noted that Tori had the leadership, policy development and political experience from his extracurricular activities and mission work during his time Hope that could make him well suited to be Surgeon General one day! The significance of that observation is not lost on Tori who now serves under the current Surgeon General. While only time will tell if Dr. Sanford's vision of Tori as a future U.S. Surgeon General will come to reality, his goal in the next ten years is to continue to serving the state and country in public health.



WHY I GIVE: KEN '73 & PATSY '72 JANDA

Interview and article by Kristin Dittenhafer-Reed

“A personal relationship with a faculty member can broaden a student’s horizons and jump-start a career.”

Dr. Ken Janda and Patsy (Meliere) Janda support the Hope College Department of Chemistry through their generous support of the summer research program. Ken graduated from Hope in 1973 with degrees in chemistry and physics; Patsy earned a degree in biology in 1972. After earning his Ph.D. at Harvard University, Ken entered a career in academia. He spent the majority of his career as a faculty member in the chemistry department at University of California, Irvine, where he also served as dean of The School of Physical Sciences. Patsy earned her degree in biology from Hope in 1972 and went on to earn a MS degree in Clinical Laboratory Science from Northeastern University. Although she loved working in hospital laboratories for ten years, she switched to education to achieve a schedule more convenient for raising their two children. Now retired, Ken and Patsy enjoy spending time with their family and traveling the world, a passion that began during time spent abroad as Hope students.



Ken and Patsy Janda

CONNECTION: Ken and Patsy fondly remember the mentorship they received from faculty at Hope. Their interactions with faculty started the summer before their freshman year when they participated in a National Science Foundation program designed to jump-start future science majors. It was through this program that they met each other and Dr. Sheldon Wettack, a recent addition to the Hope College chemistry faculty. Ken did research in the Wettack lab during most of his time at Hope. He is one of Wettack’s Research Warriors, a group of 20+ people who worked with Dr. Wettack and went on to remarkable careers in science. (Read more about Dr. Wettack and a reunion of his Research Warriors [here](#).) Ken and Patsy recall feeling as if they were a part of a family at Hope, being welcomed into the homes of faculty members and receiving individualized guidance that helped them succeed at Hope and beyond.

MOTIVATION: Ken and Patsy are strong proponents for the student-faculty collaborative research program at Hope. They each performed research as Hope students and found it brought the classroom to life. Research also was a place where strong mentoring relationships with faculty were forged. They feel strongly that these close relationships between faculty and students can expand a student’s perspective and open up a variety of opportunities. Ken carried the tradition of supporting undergraduate research into his professional career and is recognized for mentoring undergraduate research students as a chemistry faculty member and dean at UCI. He is proud that 19 of his undergraduate mentees were successful enough to serve as coauthors on publications from his research group.

IMPACT: As first-generation college students, Ken and Patsy hope to empower upward mobility in the next generation of scientists graduating from Hope College. They generously support the F. Sheldon and Marilyn Wettack Summer Research Scholars Fund. This program now supports three student summer research stipends each year, with a primary goal to support those working in interdisciplinary projects, first year students, and/or students from backgrounds underrepresented in the sciences. They are delighted to support Hope’s growing and thriving campus and continue Hope’s legacy of sending students to some of the best graduate schools in science.

The Hope College Department of Chemistry is grateful for donors who generously give back to support our mission of providing excellent undergraduate chemistry education and research experiences for all students.



IN MEMORIAM

DR. DOUG NECKERS '60

Dr. Douglas Neckers '60, a 2015 Distinguished Alumni Award recipient whose accomplished career as a photochemical scientist included several years on the Hope College faculty, died on November 22, 2022 at the age of 84. Neckers taught at Hope from 1964 to 1971, and in addition to teaching led an active research program involving students. He remained actively involved with the college and Department of Chemistry in the years that followed. In 2016, he wrote the book "Cal VanderWerf: Anchor of Hope," celebrating Hope's eighth president — who led the college from 1963 to 1970 — for emphasizing Hope's academic quality and the model of collaborative faculty-student research for which the college continues to garner national acclaim. Doug was retired from the faculty of Bowling Green State University, where he had established the Center for Photochemical Sciences. He was also the founder and longtime CEO of Spectra Group, a photochemical sciences company specializing in 3D printing. Dr. Sanford remembers Doug as having Hope close to his heart as an alum and as a former faculty member. Neckers was personally invested in the Chemistry Department and the success of Hope as an institution. He loved the liberal arts and doing science in the context of the liberal arts. Read more about Neckers and his many accomplishments [here](#).



DR. RODNEY BOYER

Dr. Rodney Boyer, who retired from the Hope Chemistry faculty in 2000 after 26 years at the college, died on February 28, 2022 at the age of 79. Boyer joined the Hope faculty in 1974. In addition to teaching, conducting research and writing biochemistry textbooks, he chaired the department for six years. While at Hope, Dr. Boyer directed the work of more than 75 undergraduates in research supported by the NIH, NSF, and numerous other organizations. He published numerous articles on iron metabolism in humans and on biochemical education. He relocated to Montana after retiring from Hope. He continued to be active professionally, writing several biochemistry textbooks, serving as an associate editor for the journal of Biochemistry and Molecular Biology Education, and consulting in biochemistry education with the American Society for Biochemistry and Molecular Biology. Dr. Boyer is pictured below working in his laboratory and advising a student.

