Department of Chemistry, Gettysburg College

ALUMNI NEWSLETTER 2019-20 AY

Faculty and Staff

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Timothy Funk, Chair
Robert Garrity
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Roger Heckman
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Nicholas Kettenhofen
Jeremy Kuhar
Jason Labonte
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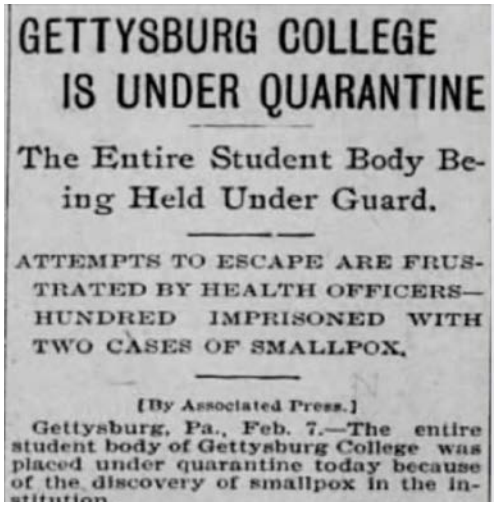
The Year in the Chemistry Department-Pandemic Version

The 2019-2020 Academic Year was one for the history books! After a normal, busy fall semester, we began the spring semester as usual but the global pandemic forced us to close campus in March 2020. After an extended spring break and some frantic restructuring, we resumed classes in a virtual setting. If only we had all bought stock in Zoom last February. We all learned new ways of teaching and learning, encountering many challenges but also many opportunities. The College postponed in-person graduation ceremonies but held a virtual celebration honoring our 2020 graduates. The Chemistry Department also held a smaller, more intimate virtual event, which allowed graduates and their extended families and friends to attend from across the country and around the globe. Our annual departmental award ceremony was also held virtually.



GETTYSBURG COLLEGE IS UNDER QUARANTINE

The Entire Student Body Being Held Under Guard.

ATTEMPTS TO ESCAPE ARE FRUSTRATED BY HEALTH OFFICERS—HUNDRED IMPRISONED WITH TWO CASES OF SMALLPOX.

[By Associated Press.]

Gettysburg, Pa., Feb. 7.—The entire student body of Gettysburg College was placed under quarantine today because of the discovery of smallpox in the in-

1905 newspaper clipping showing that the problems we face today are not new. Modern technology is a major factor in supporting faculty and students as they address current challenges.

Seven Chemistry majors and eleven Biochemistry and Molecular Biology (BMB) majors graduated, with one student completing his degree requirements by December of 2019. Six students participated in research with two faculty members in the Chemistry Department during the summer of 2020, as part of a program sponsored by the Cross-Disciplinary Science Institute at Gettysburg College (X-SIG). This was a much smaller summer research group than usual with students participating remotely rather than working together in our Science Center labs. You can find out more at the X-SIG webpage, and be sure to take a look at the blog, too!

In the fall 2019 semester, the Chemistry Department hosted **Prof. Helen Blackwell** on campus as our 41st Musselman Visiting Scientist. We also hosted other speakers on campus prior to campus closing, as did the Sceptical Chymists. A group of Chemistry students and faculty traditionally attend the spring ACS meeting, but those plans—like so many others—were thwarted by COVID-19.

We love hearing from alumni and friends of the Chemistry Department, so please keep in touch with us as you move through your careers and your lives! You can find a link to a form to submit an update on the Careers and Alumni page of the Chemistry Department webpage.

We emailed the Chemistry Department Alumni Newsletter to *almost* everyone. You received a paper copy only if we don't have your email address or if you requested no emails from the College. If you received a paper copy but would prefer an electronic version in future years (or if you received an electronic newsletter but would prefer to receive a paper copy), please let us know by emailing **Lea Czar** at lczar@gettysburg.edu, writing to the Chemistry Department at Campus Box 393, Gettysburg College, Gettysburg, PA 17325 or calling us at 717-337-6252.

COVID-19 and Chemistry at Gettysburg

The COVID-19 pandemic has affected the Chemistry Department in ways large and small. After a normal first half to the spring 2020 semester, we switched to remote learning like the vast majority of colleges and universities across the country. Faculty had to switch their courses to online formats and learn/brush up on a host of new technologies. If the switch to remote learning with little time to prepare was not enough, students were spread across time zones, which made synchronous classes challenging. Additionally, not all students had access to reliable internet access once they left campus, so Gettysburg College IT sent wireless hotspots to students who needed them. Virtual office hours through Zoom and prerecorded lectures became common in content-heavy classes. Class discussions were still an option, but the stress of a global pandemic, the unknown nature of the disease, and the widely varied remote learning environments of our students caused them to be much less vibrant than during a typical spring semester.

One of the biggest challenges was modifying the labs. Of course we take a great deal of pride in engaging students in a wide variety of lab experiences—ranging from general chemistry labs to senior research projects—and they are nearly impossible to replicate *safely* at home. Many of our laboratories emphasize data analysis, so students were provided with data instead of collecting it themselves. To add insult to injury, Pennsylvania regulations stated that we were not allowed on campus so individual faculty were unable to collect new data and send it to students. Instead, data from previous experiments were provided. Even with these challenges, students were still able to analyze data and present their results in written and oral formats. A few of our teaching laboratories were running independent projects last spring, and most students pivoted from running experiments to proposing experiments. While they missed the opportunity to learn through experimentation, those students gained experience designing experiments and writing proposals, which are valuable skills themselves.

Our senior research students got the raw end of the deal last spring. Many of them were finishing their research as they were writing their theses, and those final experiments were never run. Additionally, their plans to attend and present their discoveries at the Philadelphia American Chemical Society National Meeting were dramatically disrupted. Some students submitted their posters to be part of the virtual meeting, but it was nowhere near the same as being there in person. A group of us also planned to attend the annual Intercollegiate Student Chemists Convention at Franklin & Marshall College in April, but it was also canceled. What a disappointing end to a college experience!

One silver lining of this experience is that it forced the Chemistry faculty to reevaluate our curriculum and our learning goals. These conversations had been occurring before the pandemic, but the dramatic changes it imposed did not allow us to continue with "business as usual." Instead, we reconsidered what knowledge and skills were the most important and focused our efforts on making sure students achieved them. Fortunately, we discovered that our academic and practical goals for students before the pandemic largely aligned with them in the midst of it. The other positive spin we can put on this sad experience is that students and faculty have a much higher degree of comfort working remotely. Digital tools that were largely unused by some of us are now familiar and will likely find utility in a post-pandemic world. Virtual seminars will not replace in-person visits once the danger of the virus has passed, but they will allow us to periodically hear from scientists all over the country and the world with virtually (pun intended) no expense. There is no question our lives as students, teachers, and citizens have been forever changed from this experience.

Faculty Tidbit: *Professors Thompson, Suryn and Kuhar often bicycle to work in good weather. Professors Wedlock, Jameson, Buettner and Sengupta walk to campus. Prof. Frey and Prof. Gregory are avid runners. Prior to COVID restrictions, Professors Funk and Thompson participated in pick-up soccer games and Prof. Funk attended yoga classes in the Jaeger Center.*

Class of 2020

Seven senior chemistry majors and twelve senior biochemistry/molecular biology (BMB) majors completed their undergraduate work in the past year. Two graduates received a B.A. degree; the rest received the B.S. degree. Four graduates received ACS Certification. Seven seniors were awarded Honors in their major, four were elected to Phi Beta Kappa, four graduated *summa cum laude*, four *magna cum laude*, and two *cum laude*. Eleven are currently pursuing graduate work.

Evan Bertonazzi (Chem), a *magna cum laude* graduate, is working as a chemist at Axalta Coating Systems. **Rikard Bodin** (Chem), a *cum laude* graduate, is enrolled in graduate studies at the University of Utah. **Kim McCaskey** (Chem/Music) is working at Eurofins Lancaster Laboratories. **Shelby Nicolau** (Chem), a *magna cum laude* graduate, is a graduate student at the University of Michigan. **Katie Kratz** (Chem) plans to teach high school chemistry, and **Claire Benstead** (Chem/Anthropology) is making plans for the future. **Olivia Peduzzi** (Chem), Class of 2020 salutatorian and a *summa cum laude* graduate, is attending graduate school at Penn State.

Meghan Adler (BMB) is a journeyman, working in the Biotechnology Branch of the Army Research Laboratories, Adelphi, MD. **Melanie Hempel** (BMB), a *magna cum laude* graduate, is enrolled for graduate study in biochemistry in the Virginia Tech PhD program. **Alexander Paredes** (BMB) is attending graduate school. **Hannah Scheffer** (BMB) is attending nursing school at Salisbury University. **Erin Schroeder** (BMB), a *summa cum* laude graduate, is enrolled in the Duke University, Molecular Genetics and Microbiology Ph.D. program. **Jon Trilleras** (BMB) is working toward a BS/MS in biomedical engineering at Washington University in St. Louis. **Marana Tso** (BMB), a *magna cum laude* graduate, is attending the Uniformed Services University of Health Sciences at Bethesda, MD under their Emerging Infectious Disease Ph.D. program. **Katie Watson** (BMB) is enrolled in the University of Vermont's Biomedical Sciences Master's program. **Claire Woodward** (BMB), a *summa cum laude* graduate, is working toward her Ph.D. in Biochemistry & Molecular Biophysics at the University of Pennsylvania.

The Chemistry Department awarded Honors to **Claire Benstead, Evan Bertonazzi, Shelby Nicolau** and **Olivia Peduzzi**. **Melanie Hempel, Erin Schroeder** and **Claire Woodward** received BMB Honors.

The Southeastern Pennsylvania Section of the American Chemical Society honored **Olivia Peduzzi** this past spring as the outstanding senior chemistry major. **Olivia** also received the Stine Chemistry Prize and the ACS Division of Physical Chemistry – Undergraduate Award. **Alexander Paredes** received the John B. Zinn Chemistry Research Award and the General Chemistry Laboratory Assistant Award.

Katie Watson was named the Banner Carrier for BMB. **Shelby Nicolau** was named the Chemistry Department Banner Carrier and received additional awards: The Society for Analytical Chemists of Pittsburgh College Chemistry Award, the ACS Division of Analytic Chemistry – Undergraduate Award and the ACS Division of Inorganic Chemistry – Undergraduate Award. **Bryn Werley** ('23 Chem/Music) received the CRC First-Year Chemistry Achievement Award.

The ACS Division of Organic Chemistry granted **Evan Bertonazzi** their Outstanding Senior Award. **Jordyn Markle** received the Organic Chemistry Award**. Rebecca Moore** received the Organic Chemistry Lab Assistant Award. **Claire Woodward** received the BMB Award. The ACS Division of Physical Chemistry granted their Undergraduate Award to **Olivia Peduzzi.**

Sceptical Chymists granted their Achievement Award to **Emily Howe** and Past President Award to **Olivia Peduzzi.**

Sceptical Chymists

The Sceptical Chymists had another busy year of lectures, activities, and social events under the guidance of senior **Olivia Peduzzi** ('20 Chem).

Our first speaker of the year was **Prof. Lauren Toote** from Elizabethtown College who talked about her lab's work on the use of nanoparticles in the development of at home diagnostics. Then we hosted **Prof. Lou Charkoudian**, from Haverford College who spoke about her lab's research on understanding transient

interactions in biosynthetic pathways. The spring semester began with a couple of lectures focused on lanthanide chemistry, the first from **Prof. Joey Cotruvo** at Pennsylvania State University, and then from **Prof. Chris Kotyk** ('08 Chem) at Wheaton College. Soon after Prof. Kotyk's visit, we were all scattered across the country, and had to cancel our remaining seminars.

Outside of the lecture hall, the Sceptical Chymist executive board was busy planning social activities that successfully increased attendance at all of our club events. Our chymists used their chemical know how to engage students by making liquid nitrogen ice cream, borax crystal growing, and conical tube "fall' globe making. We held our standard spring awards night virtually, which featured a rousing game of periodic table bingo, distribution of student awards, and the election for the 2020-2021 Sceptical Chymist officers. Everyone had a great time!

If you would like to see pictures from the events or just keep up with the Sceptical Chymists' events and activities, please visit our Facebook page.

News from our Graduates

We enjoy hearing from you so keep those cards, letters and e-mails coming! If you can provide information about your classmates, we like that, too. For those who prefer to correspond electronically, you can find our email addresses through the departmental web page. Or you may update us through a link on the Chemistry Department Careers & Alumni webpage.

Nicholas Boire ('07 BMB) graduated from St. George's University School of Medicine MD program in 2019 and started his medical residency at the Mayo Clinic, Rochester, MN. In August 2020, the St. George's University website featured an article about Nicholas' COVID-19 research at the Mayo Clinic.

Robert Joseph Fortenbaugh ('13 Chem) completed his PH.D. in Chemistry at Penn State University.

Chris Kotyk ('08 Chem) returned to Gettysburg College in March 2020 to discuss his research on rare earth metals. As an undergraduate, Chris did his senior thesis with Dr. Wedlock. He earned his Ph.D. at the University of California, Irvine and is now an Assistant Professor in the Chemistry Department at Wheaton College in Massachusetts. The Kotyk lab recently published in Inorganic Chemistry on the luminescence of lanthanide complexes with perfluorinated alkoxide ligands. Chris is currently on parental leave while he and his wife, Juliet, welcome their daughter, Layla, born in April 2020.

Andrew Sydenstricker ('17 BMB) started a new job with the Peace Corps in Tbilsi, Georgia.

Vince Venditto ('03 Chem), Assistant Professor at University of Kentucky College of Pharmacy, married Kristie Colon on June 21, 2019 in Lexington, KY.

Danny Zeng ('15 Chem), currently a Ph.D. candidate in the University of California, Santa Barbara, Department of Chemistry and Biochemistry, recently published an article in the October issue of Science Magazine on upgrading end-of-life plastic into value-added materials as a way to redefine how society sees its waste.

Many of you stay involved with campus life, including **Walter Maust** ('63 Chem) who helped to plan the 55th Reunion of the Class of '63 and **Fred Schumacher** ('69 Chem) who served as co-chair of the planning committee for the 50th reunion of the Class of '69.

We are saddened to hear of deaths among our Chemistry alumni family. In the last year, we lost **Marilyn Huzzard Benson (**'55 Chem) in July 2019, **Donald W. Brandt** ('57 Chem) in August 2019, **James G. Dickensheets** ('41 Chem) in August 2019, **Russell E. Fink** ('49 Chem) in March 2019, **Charles E. Gaul II** ('50 Chem) in January 2019, **Nancy Dreier Kahler** ('50 Chem) in April 2019, **Don C. Kleinfelter** ('56 Chem) in June 2019**, Donald W. Merryman** ('59 Chem) in November 2019, **Pauline Dale Platt** ('53 Chem) in November 2019, **Mark S. Tome** ('50 Chem) in August 2019 and **M. Leroy Zeigler Jr.** ('51Chem) in September 2019.

Staffing News

Prof. Koren Lipsett retired at the end of the 2019–2020 academic year after 28 years of service to Gettysburg College. She was hired in 1992 when the BMB program began, and she has taught (and created) many courses, including both semesters of biochemistry, forensics, and general chemistry. She also co-developed Chemistry 105: Down on the Farm, where students analyzed samples in lab collected on her farm south of town. A total of 102 students worked in her research lab; they were co-authors on research articles and regularly presented their results at conferences. We miss Koren already and wish her the best of luck in this new chapter of her life!

Two Visiting Assistant Professors joined the Chemistry faculty for the 2020-21 academic year. **Prof. Jason Labonte** is teaching general chemistry and biochemistry courses this year. He earned his Ph.D. at Johns Hopkins University and previously taught at Franklin & Marshall College and Loyola University Maryland. Prof. Labonte is conducting on-going research at Johns Hopkins in computational glycoengineering and virtual post-translational modification of proteins.

Prof. Labonte and Prof. Sahadeo

Prof. Emily Sahadeo is teaching general chemistry, Instrumental Analysis and Materials Chemistry this year. She completed her Ph.D. in May 2020 at the University of Maryland where she taught and participated in research. Her research focused on synthesis of electrodeposited manganese dioxide and PEDOT cathodes for use in rechargeable magnesium batteries, surface properties of cathodes and anodes using X-ray Photoelectron Spectroscopy to elucidate fundamental charge storage mechanisms and Atomic Layer Deposition in improvement of interfacial chemistry and reactivity of battery electrodes.

Reseach and Professional News 2019-20

The **Buettner** lab continued their work on developing *de novo* proteins to function as hydrolases; **Alexander Paredes** ('20 BMB), **Olivia Peduzzi** ('20 Chem), and **Brittany Loh** ('22 Chem) continued in the lab, and we added **Micaylah Bowers** ('23 BMB) during Fall 2019. **Alex**, **Olivia**, and **Brittany** were all set to present posters at the national American Chemical Society meeting in Philadelphia, PA, where **Alexander**'s poster was selected for the SciMix session, but due to COVID, their three posters were whittled down to two virtual posters we presented. **Olivia** and **Alex** both graduated in Spring 2020, leaving us with a bit of a void that **Brittany** and **Micaylah** are quickly filling. **Brittany** and **Micaylah** both spent the summer "in" the lab doing virtual research supported by X-SIG. We are excited for days when we can all be back in lab together studying our mini- metalloenzymes.

Professor Thompson's nanolab has continued to work on understanding the interfacial dynamics of polymers on gold nanoparticles. **Claire Benstead** ('20 Chem and Anthropology) and **Shelby Nicolau** ('20 Chem) continued their research from the summer of 2019 into the academic year working on their projects to study pH induced assembly of gold nanorods and gold and silver nanoparticle-polymer composite materials respectively.

Prof. Buettner, **Alexander Paredes, Olivia Peduzzi,** and **Brittany Loh** had two virtual poster presentations at the American Chemical Society meeting (March 2020), titled: "*DNA cleavage with a titanium mini-metalloenzyme,*" and "*Binuclear zinc hydrolase mimics for DNA cleavage."*

Prof. Buettner, Prof. Frey, Olivia Peduzzi, Katie Madore ('20 Bio), and **Claire Woodward** ('20 BMB) had a poster presented by **Prof. Kurt Andresen** in Physics at the annual Biophysical Society meeting in San Diego, CA (February 2020), titled: "*Irreversibility of Conformational Changes and Zn^{2+} Binding to DNA*."

Alexander Paredes, Brittany Loh, Olivia Peduzzi and **Prof. Buettner** had a paper published in *Inorganic Chemistry* titled: Cleavage by a *de novo* Designed Protein–Titanium Complex.

Prof. Thompson, Shelby Nicolau ('20 Chem), **and Claire Benstead** ('20 Chem and Anthropology) were scheduled to travel to Philadelphia to present at the ACS national meeting in the spring of 2020 before the pandemic cancelled the meeting. **Prof. Thompson** was awarded a Burroughs Wellcome Fund Collaborative Research Travel Grant for his upcoming sabbatical to work with Jean-François Masson at the University of Montreal on developing new surface plasmon resonance biosensors for blood typing and antibody testing for SARS-CoV-2.

In December 2019, **Prof. Frey** traveled to Berlin, Germany to attend the Biomembrane Days meeting and presented a poster "Measuring the interaction of polyglutamine peptides with lipid membranes" and chaired one of the sessions. Then, in February 2020, she gave an invited lecture "Interactions of huntingtin with model cell membranes" at Bucknell University as part of their Chemistry Seminar Series. In late February 2020, Frey attended the Biophysical Society annual meeting in San Diego, CA and presented a poster "Functionalized polystyrene nanoparticles alter the structure and stability of model cell membranes" with **Paige Ashey** ('21 Chem) as a co-author. While scheduled to attend the spring American Chemical Society meeting in March 2020 in Philadelphia with three Lipid Lab students, the pandemic had other plans. Paige Ashey ('21 Chem) was to present her poster "Functionalized polystyrene nanoparticles alter the structure and stability of model cell membranes" and **Jon Trilleras** ('20 BMB) had one titled "Measuring the interaction of polyglutamine peptides with lipid membranes" but both were withdrawn when the conference went virtual. During a virtual session of the ACS meeting, **Jordyn Markle** ('22 BMB) gave a talk "Interaction of PrP(106-126) with model cell membranes" as part of her Colloid and Surface Chemistry PUI Student Award.

In Lipid Lab, **Prof. Frey** continued work on projects revolving around the theme of structure and function of cell membranes with a focus on understanding biophysical interactions of neurodegenerative proteins and functionalized nanoparticles with cells. During the 19/20 academic year, **Jon Trilleras** ('20 BMB) worked on the structural and thermodynamic characterization of huntingtin peptides binding to cell membranes while **Jordyn Markle** ('22 BMB) ran parallel experiments on prion-based systems responsible for several fatal and transmissible neurodegenerative diseases. **Paige Ashey** ('21 Chem) continued her work using fluorescence microscopy to study how nanoparticle functionalization affects their interaction with cell membranes with a new focus on measuring induced changes to the interfacial material properties. Due to the pandemic, Summer 2020 research looked quite different than usual and Lipid Lab went remote with members working from home. Jordyn focused on honing analytical methods to better process our circular dichroism data while Paige worked on a manuscript draft. **Kacie Herr** ('22 BMB) and **Abby Reitz** ('22 Chem) joined the lab and learned techniques and data analysis to help them hit the ground running when back in the physical lab in 20/21.

Prof. Frey and **Prof. Buettner** applied as Co-PIs for a grant from the Camille & Henry Dreyfus Foundation Jean Dreyfus Lectureship for Undergraduate Institutions. In November 2020, the Dreyfus foundation awarded them $18,500 to bring a prominent chemistry speaker to campus and support two summer research students.

Prof. Labonte joined the department as a Visiting Assistant Professor this past summer and is teaching General Chemistry I and Biochemistry II. He has enjoyed the welcoming culture of the Chemistry Department and is delighted to be meeting so many wonderful students. As part of Biochemistry II labs, the students will be participating in a CURE program as part of the D2D Network, where they will each design their own enzyme variant of a catabolic enzyme; hypothesize on its change in stability and/or function; build, purify, and test the enzyme; and ultimately upload their data to a national database. He is an author on a recent pedagogical paper about the program ("Development of a Broadly Accessible, Computationally Guided Biochemistry Course-Based Undergraduate Research Experience." J. Chem. Educ. 2020, in press.). The D2D CURE program uses Rosetta software for its design, and Labonte's own research has contributed code into that software suite, particularly the addition of carbohydrate functionality. He collaborated with Rosetta researchers on four papers published in the 2019–20 academic year, and two more are in press this month.

Prof. Suryn has continued teaching both the general and organic chemistry yearlong sequences, along with overseeing the general chemistry labs. During the AY 2019-2020 he was part of a committee to develop an intensive version of the general chemistry sequence meant to better support our students coming to Gettysburg without a solid foundation in math and chemistry. The AY 2020-2021 will be the first year that this course takes place, and we are hoping it is a success! He also organized an Art in Science competition in the spring to help showcase the beauty of sciences and scientific research. Unfortunately, this event had to be canceled when students were sent home, but he plans to pursue it again either in-person or virtually in the future.

Prof. Jameson has resurrected a long-dormant research project on cobaloximes, in particular, cobaloximes of the chiral ligand camphorquinone dioxime. **Emma Armstrong** ('21 Chem) continued her summer work during the 2019-2020 academic year until COVID hit. She was able to grow crystals of sufficient quality to obtain a crystal structure. We were set to present a poster on this work at the Philly ACS meeting in March, when COVID lead to the cancellation of the meeting. Teaching has been dominated by adjustments we had to make to teach remotely. Never was so much technology learned in so little time (and with the help of so many younger, tech-savvy colleagues…). Who knew that they sold Surface Pros without a stylus! The spring 2020 organic classes were good sports as we all tried to master this new technology. Lecture videos were posted on Moodle and class problems session run on Zoom – essentially a flipped class. **Prof. Funk** watched on with a devilish grin.

Prof. Wedlock spent the Fall semester on sabbatical leave at the University of Pennsylvania visiting the research group of **Prof. Joe Subotnik**, where he was able to attend graduate classes, seminars, group meetings, and work with post-docs and graduate students. Professor Subotnik's group works in the area of theoretical and computational chemistry, with a focus on learning about chemical dynamics. This was an excellent opportunity to begin to catch up on developments in the world of theory as well as learning the advantages of having many food trucks within a few blocks of the chemistry department.

Prof. Sahadeo joined the department as a Visiting Assistant Professor in the summer of 2020 and is teaching Instrumental Analysis, Materials Chemistry, and General Chemistry II. She has had a great experience getting to know the students and other faculty in the Chemistry Department. In addition to teaching, she is working on publishing the final chapter of her dissertation, which investigates the effects of nanostructure and electronic conductivity on the electrochemical performance of composite manganese oxide cathode materials for rechargeable magnesium batteries.

The **Funk** lab continued to focus on the development of sustainable alcohol oxidations and carbonyl reductions using (cyclopentadienone)iron carbonyl catalysts. **Melanie Hempel** ('20 BMB) broadened the substrate scope of our alcohol oxidation reaction by using bio-based furfural as the hydrogen acceptor. She also performed a number of important mechanistic experiments to finish our *Journal of Organic Chemistry* paper on diol lactonization. **Evan Bertonazzi** ('20 Chem) continued his work determining how cyclopentadienone electronics affect catalyst activity. He isolated a trimethylamine-bound catalytic intermediate and characterized it by NMR spectroscopy and mass spectrometry. He set up some recrystallizations before spring break with the hope of growing x-ray crystallography-quality crystals, but due the pandemic he was unable to come back to campus to check on them. **Bryn Werley** ('23 Chem/Music) and **Auden Cameron** ('22 Chem) joined the group and worked with Evan on his project, and they are continuing with their projects this year. **Kim McCaskey** ('20 Chem/Music) explored whether our catalysts were selective at oxidizing primary or secondary alcohols. She discovered that most catalysts under

a variety of conditions were more selective for secondary over primary oxidation. **Yumeng Cao** ('21 Chem) also looked at selective alcohol oxidations, but she discovered—based on mechanistic insight from Melanie's work—that a certain subclass of our iron catalysts selectively oxidize primary alcohols.

We worked on a few other projects, too. **Peter Zhang** ('21 BMB) began working on a new collaborative project with **Prof. Vince Venditto** ('03 Chem), who is a professor at the University of Kentucky School of Pharmacy. Peter synthesized triazine-based lipids potentially for use in antigen delivery for vaccines. **Chloe May** ('21 Chem) revisited the dental polymer project that **Dr. Olivia Cromwell** ('10 Chem) and **Travis Beard** ('14 Chem) worked on. Her goal was to determine if the photolabile triazene functional group survived the conditions we used to synthesize our polymers. She synthesized a trizene-containing acrylate polymer that was soluble in common solvents and used a variety of spectroscopic techniques to identify the triazene group after polymerization. While there was no formal research in the Funk group during the summer of 2020 due to COVID-19, **Bryn Werley**, **Auden Cameron**, **Chloe May**, **Peter Zhang**, **Yumeng Cao**, **Emma Armstrong** (Dec '21 Chem), **Prof. Tim Funk**, **Prof. Don Jameson**, and **Prof. Greg Suryn** held a weekly synthesis literature discussion throughout the summer. It was a lot of fun and we all learned some new chemistry!

Prof. Tim Funk gave an invited talk at Colgate University in October 2019 titled "*Sustainable Redox Transformations with (Cyclopentadienone)Iron Carbonyl Compounds*." **Evan Bertonazzi** ('20 Chem), **Melanie Hempel** ('20 BMB), and **Kim McCaskey** ('20 Chem/Music) were all supposed to present posters at the ACS National Meeting in Philadelphia in the spring, but the pandemic caused the meeting to run remotely and we did not end up submitting our posters. The Funk group published a paper in the *Journal of Organic Chemistry* titled *"(Cyclopentadienone)iron-Catalyzed Transfer Dehydrogenation of Symmetrical and Unsymmetrical Diols to Lactones"* including important contributions made by the following student co-authors: **Tracy Tang** ('19 Chem/CS), **Rowan Meador** ('16 Chem), **Casina Malinchak** ('13 Chem), **Emily Harrison** ('18 Chem), **Kim McCaskey**, and **Melanie Hempel**. **Prof. Funk** also received a National Science Foundation grant for his iron catalysis project. The grant was titled "*RUI: CAS: Development of Iron Catalysts for Sustainable, Selective Oxidations and Reductions*" and it will fund the project for the next three years.

Top Row (left to right) Prof. Buettner, Prof. Funk, Prof. Thompson, Prof. Kuhar
Center Row (left to right) Prof. Labonte, Prof. Frey, Prof. Jameson, Prof. Sahadeo
Bottom Row (left to right) Prof. Sengupta, Prof. Suryn, Lea Czar, Prof. Wedlock

2020 Summer Research Students and Faculty

Research opportunities were limited this summer due to the pandemic. However, Prof. Frey and Prof. Buettner were able to develop remote research programs for their students.

The Cross-Disciplinary Science Institute at Gettysburg College (X-SIG), directed by Prof. Frey, annually funds summer research in the sciences. X-SIG programming prepares students to answer science's most pressing questions across multiple disciplines, equipping students with skills necessary for modern research and allowing them to explore the practical and ethical aspects of being a scientist.

In addition to the six Chemistry and BMB students working remotely on research, 29 other students participated in biology, computer science, psychology, and physics summer research.

Chemistry/BMB faculty and students who participated in summer research projects gathered for this photo in fall 2020 after students returned to campus. Pictured are (left to right) Abby Reitz ('22 Chem), Kacie Herr ('22 BMB), Prof. Frey, Paige Ashey ('21 Chem), Prof. Buettner, Jordyn Markle ('22 BMB), Micaylah Bowers ('23 BMB) and Brittany Loh ('22 Chem).

Gifts to the Department

The Chemistry Department would like to thank the generous donors who supported the Department, our students and the College with financial gifts from September 2019 through August 2020. All gifts are welcome and much appreciated.

The following donors made gifts to the Chemistry Special Gifts Fund: Jen Becker '97, Bob Britcher '68, Amy Lucadamo '00 & Tim Funk '00, Ewah and Ron Myers '69, Anne Kuhlmann Taylor '66 and Jerry Taylor. Molly Hoke '95 donated to the Rowland Memorial Fund in support of the Science Center Complex.

In 2018, Gettysburg College established a fund in honor of recently retired Chemistry Department faculty members, **Prof. Joe Grzybowski** and **Prof. Bill Parker.** The fund supports student/faculty research in the Chemistry Department. Many of you sent donations to this fund, which quickly reached endowment status so earnings from the fund will benefit the Chemistry Department for years to come. Donors to the Parker-Grzybowski Fund include Mary Lou & Richard Strunk '63, Steve Lind '73, Tina Tao Maynes '05 & Jeff Maynes '05, Linda & Keith McDaniel '80, Patricia & Dennis Bleile '72, Kyonggeun Yoon '70 & Bruce Johnson, Kristie Colon & Vince Venditto '03.

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We would like you to know that gifts to the **Chemistry Special Gifts Fund** or to the **Parker-Grzybowski Fund** directly benefit Chemistry Department programs and students. Gifts designated for the Chemistry Department ***without a specified fund*** go to the Gettysburg Fund, supporting ongoing, college-wide expenses. If you would like the Chemistry Department to have direct access to your donation to support student/faculty research, student participation in conferences, instrumentation upgrades or repairs and other specific needs of the department, please make a note on your donation indicating "**Chemistry Special Gifts**" or "**Parker-Grzybowski Fund**".

If you choose to make an on-line donation, you can do so here or by going to the Gettysburg College homepage and clicking on "Make a Gift". In the Designations portion of the on-line form, select "Other or multiple designations". Slide the bar to the right of the pop-up down to the bottom, select "Other Fund(s)", and hit the Continue button. In the box under "Please Specify", type the fund name (e.g. **Chemistry Special Gifts Fund** or **Parker-Grzybowski Fund**).

Professor Donald Fortnum 1932-2021

Dr. Donald Fortnum, professor of chemistry, emeritus, Gettysburg College, died on February 2, 2021. His family plans private services with interment in upstate New York.

Fortnum earned his undergraduate degree in chemistry and mathematics from Carroll College. In 1958, he completed his doctorate in chemistry from Brown University, along with another young man, **Prof. Alex Rowland,** who would also go on to teach chemistry at Gettysburg College. Prof. Fortnum began his teaching career at Ursinus College.

In 1965, Fortnum joined the chemistry faculty at Gettysburg College where his primary teaching assignment was Physical Chemistry. P-Chem was and still is an especially challenging course, made even more so during Prof. Fortnum's years of teaching because the class was scheduled at 8:00 a.m. on Saturday mornings!

At Gettysburg, Prof. Fortnum shared his love of chemistry and computers becoming an early adopter of the emerging technology. He filled his final exams with inspiring quotations and jokes as well as challenging equations, served with a table of snacks including his homemade chocolate chip cookies.

Prof. Fortnum retired in 2000, after 35 years of teaching at Gettysburg College, the same year that **Prof. Tim Funk**, now chair of the Chemistry Department, graduated. Prof. Funk recalls that Prof. Fortnum "made a mean chocolate chip cookie and his final exams were so long that he gave them in a three-ring binder."

At Fortnum's retirement, **Prof. Bill Parker** presented a valedictory for his long-time colleague. Prof. Parker noted that Fortnum was "well-known for never throwing ANYTHING away" and recalled a Chemistry Skit Night in which a student acted the part of Prof. Fortnum. Prof. Parker reported, "The senior chemistry major, portraying Don's ability to produce anything imaginable from his bottomless pockets, produced a pile of tools, pens, pencils, rubber bands, labware, etc. on the front table." Prof. Parker went on to say that, Prof. Fortnum recognized a teachable moment and began to critique the student's portrayal, saying it lacked an important element of humor – exaggeration. All the while, Prof. Fortnum was pulling items from his pockets, creating a pile easily twice as high as that of the student doing the parody.

Prof. Parker ended his valedictory with comments that once again seem appropriate, "Don, on behalf of the Chemistry Department, the College, and those thousands of students who have passed through your classrooms, we thank you for 35 years of dedicated service as an excellent teacher and an indispensable colleague. We will miss your never wavering honesty and questioning and your unique sense of humor."

Memorials for Prof. Fortnum can be made to Local Disaster Relief, Adams County American Red Cross, 230 Greenameyer Lane, Gettysburg, PA 17325; or to Gettysburg United Methodist Church, 30 W. High St., Gettysburg, PA 17325.

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