Grove City College
Chemistry eNewsLetter
Review of 2020/2021

Departmental News

From Dr. Joe Augspurger, Chair

It would be easy to say that this was the worst year ever. It probably was the hardest. But we are grateful to God that we were able to successfully complete the academic year with in-person classes throughout. We were able to celebrate graduation on May 15 with both our 2021 graduates and 10 of our 15 2020 grads who returned for their belated graduation celebration.

I am thankful for a dedicated group of faculty who worked extremely hard, teaching classes in "hybrid" mode (using Microsoft TEAMS to include students in quarantine with students in class simultaneously) and creatively enabling our classes to continue in the midst of the pandemic.

I am thankful for generous alumni whose contributions have brought the Professor Harold L. Conder Memorial Scholarship over halfway to being fully vested when we will be able to reward our top sophomore inorganic student.

I am thankful that the Department was able to create concentrations in Forensic Chemistry for both the chemistry and biochemistry majors. We see this as a first step in adding a full major in Forensic Chemistry in a few years.

I am thankful for the work that Drs. Wong and Guevara put in this year to offer two classes (the new Introduction to Forensic Science and the General Chemistry I lecture) online for Dual Enrollment students. Grove City is building up these offerings to connect to more potential students.

I am thankful for colleagues who continued their research efforts despite interruptions as students missed time while in quarantine to provide this invaluable training for our students. Drs. Falcetta and Kriley and their students both published papers this year.

I am thankful that in these truly unprecedented times Grove City's recruiting for next year's freshman class has gone very well, so that we expect to have a total of over 600 freshmen in the Fall. We have 17 new students who have paid deposits to join our department.

I am thankful how our alumni provide opportunities for new grads. I received an email a few weeks ago from an '07 grad with a job opening and one of our '21 grads told me at Graduation that they got the job! I received another email just last week with job opportunities at their company. If you have fulltime or summer openings, let me know! I will pass them on to our students.

For these reasons we have remained positive despite the many ways COVID hindered us this year. We could not hold the seminar program we started three years ago. The National ACS meetings were not held in-person for us to attend with students. Social distancing required some labs to be held in-person only every other week. Lecturing to students wearing masks makes it very difficult to know if the students are "getting it."

Most of all I am thankful that we face these difficulties in the promise that "I (we) can do all things through Him who strengthens me."

Dr. Augspurger

Congratulations, Class of 2021 Graduates!

The class of 2021 graduates are some special people! The Chemistry department would like to congratulate them on their incredible accomplishments during their time at GCC and wish them well in their next steps. Some graduates are pursing further graduate educations at programs including PA school at Chatham, DO school at WVA, etc. Others are looking for jobs in industries and working at companies like Optical Filters USA and American Zinc Recycling, among others. Still more are pursuing careers in health-related fields, working at places like Children's Hospital or in an orthopedic practice before going to medical school. We should note that it has been an incredibly challenging year to get into graduate school and medical school, largely due to the impacts of the pandemic. The lasting impacts of students not finishing labs and overloaded application systems are taking their toll. We pray that our students pursuing these goals will have clear guidance in the coming months.

It was a joy to celebrate with these graduates and their families on a beautiful sunny day out on the Quad. We are so proud of them and cannot wait to hear what they are up to in the coming years. Grads, you are always welcome to come back to visit! Congratulations, again! May God bless you and keep you on your new journey.

Top row (left): Peter Walton, Wyatt Grimm, Hannah Nichols, Jacob Hehn
Bottom row (left): Garrett McCleary, Jacob Davis, John Lyon, Naomi Yang, Leah Rush
Not pictured: Tyler Spencer and Michael Simmons

Welcome back, 2020 Graduates!

It was our distinct pleasure to welcome back graduates from the Class of 2020 to celebrate this milestone with them one year later – in person! What a joy to see their smiling faces after a year apart, and to hear what they have been up to in the last year. A few are in graduate school (chemistry, genetic counseling, pharmacology, etc.), some are working in biology and chemistry labs across the country, and still more are finishing up Fellows programs. It was wonderful to catch up, hear about their experiences, and to see them happy and healthy. We thank God for the opportunity for them to come back and to renew friendships.

We pray for strength and continued discernment as you continue to follow the paths God has laid out before you and look forward to hearing about your journeys in the years to come!

Top row (left): Joe Augspurger, Holly Guevara, Mike Falcetta, Chuck Kriley
Middle row (left): Jimmy Olsen, Cameron Buchalter, Jacob Brown, Amber Leston, Katlyn Adams, Lydia Lyell
Bottom row: Joshua Catanzariti, Luke Pelaschier, Torres Kearney, Rachel Clark
Not pictured: Phil Gaines, Harrison Buerhle, Tim Kearney, Jacob Mast, Gillian Mazurek

Student Research

Several of our students had internship/job plans for the summer of 2020, but the pandemic derailed their plans. Despite the challenges, many of our students still had great opportunities to work in industry or carry out research in academia at places like GCC or PPG.

Other students have had the opportunity to work on research projects during the semester with professors in the Chemistry and Biology departments. Some of their experiences are outlined below. We also look forward to returning to ACS meetings with student researchers in the future!

Aidan Morse '21 – worked with Dr. Kriley synthesizing metal organic frameworks.

Garrett McCleary '21 – worked with Dr. Guevara synthesizing cyclodextrin derivatives for rotaxane building blocks.

Jacob Hehn '21, **Wyatt Grimm '21, and John Lyon '21** – designing multiplex PCR assays for rapid detection of SARS-CoV-2 infection with Dr. Shaw.

Peter Walton '21 – quantification of polyethyleneimine by UV-Vis spectroscopy with Dr. Wong

Nathan Gramm '22 – completes water analysis to monitor oil well drilling of shale in nearby Butler, Pa., with Dr. Kriley.

Calvin Raab '22 – synthesizing cyclodextrin derivatives for rotaxane building blocks with Dr. Guevara.

Amanda Schmidt '22 and **Jennifer Martin '22** – analysis of organic compounds in cosmetic products with Dr. Wong.

Grace Scofield '22 – computational screening of compounds that may bind to the active site of beta-galactosidase and inhibit enzyme activity with Dr. Shaw.

Sam Jacobs '22 and **David Mortimer '22** – worked to synthesize azobenzene derivatives and model click reactions for rotaxane dendrimers with Dr. Guevara.

Jed Speers '22 and Lydia Murphy '22 – synthesis of resveratrol and quercetin derivatives and has isolated two new complexes for testing under the supervision of Dr. Kriley

Zoe Goncz '22 and Jamin Smith '23 – worked with Dr. Kriley on the isolation of new nickel phosphine complexes as potential hydrogenation/alkylation catalysts.

Chad Grundy '22 - quantification of polyethyleneimine by fluorescence spectroscopy with Dr. Wong

Emily Bauer '23 – computational modeling on Heme interacting with membrane-bound protein with Dr. Falcetta.

Renee Wright '24 – synthesizing azobenzene derivatives as building blocks for rotaxane dendrimers with Dr. Guevara.

Titus Richardson '24 – synthesis of metal organic frameworks using lanthanides with Dr. Kriley

Professor Harold Conder Memorial Scholarship Update

When we announced the death of Dr. Harold Conder two years ago, we also announced the creation of the Dr. Harold L. Conder Memorial Scholarship Endowment. The purpose of the scholarship is to reward a Chemistry, Biochemistry or Chemistry Secondary Education major who demonstrates outstanding ability and achievement in Inorganic Chemistry and to honor the memory of Dr. Conder's 43 years of teaching and scholarship at Grove City College.

The Department already has two similar awards. The Dr. John T. Shaw Memorial Scholarship Endowment was funded by the family of long-time Organic professor Dr. Shaw (no relation to our current Biochemistry professor Dr. Shaw) in his honor and is similarly awarded to a departmental major who displays outstanding achievement in Organic Chemistry. The Walter E. Page '11 Scholarship is awarded at the end of each year to our top junior student. These awards are awarded solely on merit and are important for retaining our students who in many cases could have attended other schools and received much greater financial aid.

An endowed scholarship requires $25,000 to become fully vested, at which time the annual interest/growth of the endowment is used to make the annual award. To date, $13,080 has been donated to the endowment, meaning we still need $11,920 to reach the goal for endowment. Every gift up to $6,000 to the Conder Scholarship will be matched dollar-for-dollar. I ask you on the behalf of the department to consider donating $50, $100, or more to the scholarship endowment to help us reach our goal. Donations by check can be sent to the Office of Advancement, Grove City College, 100 Campus Drive, Grove City, PA 16127, made out to Grove City College, with Dr. Conder Scholarship printed in the memo line. To donate online, go to www.gcc.edu/givenow and select the amount you wish to give. Then click on the "Click to see more opportunities to give." In the box that comes up, scroll down under "Other Opportunities" until you see "Other" (which will be just below "2021 Senior Class Gift"), check the box next to "Other" and then click "Continue." When you see "Selected Designation box" on the next page, type in "Conder Scholarship" and then continue to fill in the required information to donate by credit card or PayPal.

Thank you for considering this important way to support the Chemistry Department and the young women and men who will benefit from this scholarship.

Curriculum Changes

As Dr. Augspurger said in the Departmental News, we have created new concentrations in Forensic Chemistry. Prospective students have been expressing interest in this area for several years, which is not surprising considering the many NCIS shows on television for many years. We have seen a few of our graduates thrive in this area (as an example, read the "Alumni Profile" on Marty Lewis in the Spring 2017 eNewsletter).

You can see the most recent "Status Sheets" (the way we summarize our major requirements) on the Registrar's Page. Click on "Advising Guides" and then on "Year 2021-22" under GCC Major Status Sheets. On the next page that comes up, click on Chemistry. Under the CHEMISTRY CORE REQUIREMENTS, you'll see the different concentrations we offer, where you can see the additional requirements to earn the Forensic Chemistry concentration. Dr. Wong (our analytical chemist) spent a summer in college at Southern Illinois University interning in an Illinois state crime lab and is creating two new classes, CHEM 151 Introduction to Forensic Science and CHEM 408 Forensic Chemistry, which will be at the core of the concentration. Students will also have to take a statistics class and a choice of two out of three courses about criminal justice and criminology.

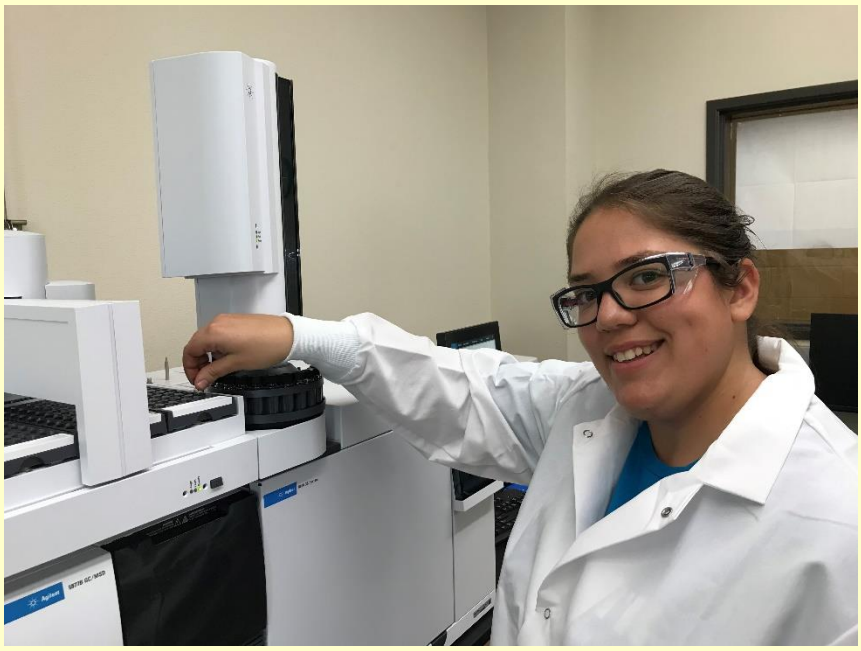
We see this concentration preparing a Chemistry major to work in a crime lab doing chemical analysis of evidence from a crime scene while a Biochemistry major will be prepared to use tools like PCR and DNA fingerprinting and better opening doors for them for jobs in crime labs. At least three current students have already signed up for the new concentrations and a few of the prospective freshmen have expressed interest.

Unfortunately, the second change that we made was to end the chemical engineering minor. It was created by former Dean Stacy Birmingham (a chemical engineering PhD) in 2017. After she left in 2018, Dr. Augspurger (a chemical engineer major as an undergrad) initially took over the third of the three ChemE classes (Reaction Engineering). The next year he took on the rest of the three classes (Material and Energy Balances and Separation Processes). This year the enrollment in these required ChemE classes was considered too low to justify continuing them to service the minor. Four of our Chemistry majors did earn the Chemical Engineering minor in the few years it was offered.

Alumni Spotlight

Alumna Chas Bomgardner begins career as a forensic scientist

One of our recent graduates, Chas Bomgardner ’19, has recently started working as a forensic chemist. She has shared some of her experiences with us and we are in turn excited to share her story with you!



One of Chas’ primary goals has always been to help people. In the sciences, sometimes one has to get creative in how to accomplish this. For Chas, her new forensics job has opened the door to achieving this goal in a very real and personal way.

After graduation from GCC in 2019, Chas got a pharmaceutical testing job at Eurofins Lancaster Labs in Lancaster, Pa., where she did analytical and preparatory lab work with various drug materials. She purified materials with recrystallization, performed melting point analysis, and regularly engaged in trouble shooting and problem solving in the lab. While Chas enjoyed her work in the lab, her dream was to work in forensics, so she began to cast a wide net for forensics jobs all over the country. In early 2021, she found a job at a crime lab in Corpus Christi, Texas. She enjoyed the transition from a large pharmaceutical lab setting to a small crime lab with less than 30 scientists.

Chas has been able to directly use some of her experiences at GCC in the lab, both at her first job at the pharmaceutical company and in her new forensics position at the Texas Department of Public Safety Crime Laboratory in Corpus Christi. In the pharmaceutical position, she used techniques like reflux, TLC, recrystallization, and melting point analysis to independently evaluate different drug compounds. She uses instruments like GC-MS regularly for analysis in forensics. The hands-on, immersive experience using many types of instruments at GCC helped prepare Chas for both of her lab positions. Most of all, she uses problem solving skills on a regular basis as she becomes more and more independent as a scientist.

Chas considers the job at the crime lab in Texas her dream job. She really enjoys the stimulation from the variety of the work that comes with taking on forensics cases as an analytical chemist. Each case brings its own unique set of data to work with and experiments that need to be performed. In particular, forensic scientists have to use the lens of the law to guide their experiments. For example, the scientists who analyze drug evidence (which is Chas's role) need to be aware of the penalties associated with each drug because they test to the highest penalty, and always must consider how much of a compound is present in the evidence. They perform a variety of tests on each drug sample to fully process it as evidence. Testing includes color testing, GC-MS analysis, and more. All the lab work points to the bigger picture of where the evidence came from and what it means for the future of real people.

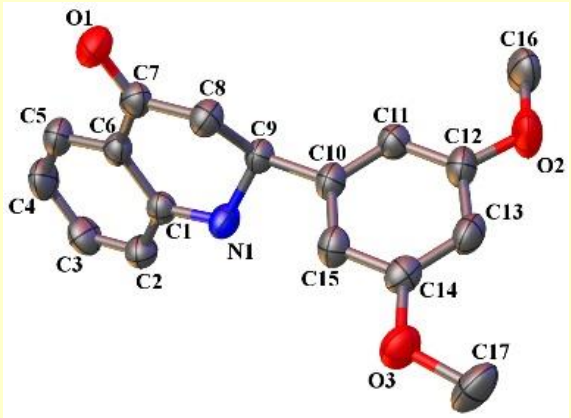
Chas is being trained in areas of forensic analysis using instruments like GC-MS, but her training will go beyond the scope of just analytical and forensic chemistry. Chas is also learning how to handle individual cases – all of the forensic data for one case is collected and analyzed at one time (for chain of custody reasons) and processed before moving on to another case. This type of work requires analytical thinking as well as adhering to the best practices put in place that help the scientist decide which samples to analyze and with what instrument, etc. Chas will also be trained to be an expert witness in court as she moves through career as a forensic scientist. While it will take several years to reach the point of testifying in court based on her scientific analysis of crime scene data, Chas is very enthusiastic about learning this new skill as well and its implications as being able to help people in the community.

Chas would like other students to know that they do not need to be limited by things like grades or challenging outcomes on assessments. She was able to successfully navigate to her dream job just a few years out of college by working hard at whatever job was before her (including the precursor pharmaceutical lab job) and by preparing as much as she could but also conveying her passion to learn and be trained along the way. She credits our good God for opening, and closing, several doors along her journey to Texas and is grateful for His continued guidance in her life and career. Chas wants to strongly encourage students and grads to pursue something they are passionate about no matter what so that you love what you do.

Faculty Spotlight

Dr. Kriley publishes paper with former student

A few years ago, a student came to Dr. Kriley with a research idea. The student, Jamie Alburger, wanted to work on developing some derivatives of Resveratrol and Quercetin compounds. The project developed a life of its own and the students have really taken the project to new heights. Currently Jed Spears and Lydia Murphy are working on isolating a series of derivatives that incorporate fluorine and bromine substituents. Jed has already isolated two of the four compounds in his project and Lydia has one of hers prepared as well.



This year with the help of Max Majireck '05 and Eric Reinheimer (Rigaku) and three prior students, Matthew Grossmann, Amy Thomas and Chris Perry, we were able to publish a Communication in the Journal of Chemical Crystallography on a derivative that they isolated. The publication is entitled "Alternative Synthesis and Structural Analysis of the Antioxidant and Antitumor Agent 2-(3,5-Dimethoxyphenyl)-2,3-Dihydroquinolin-4(1H)-One". The paper highlights the compound's crystal structure as well as a detailed chemical analysis. This is the third publication that we have been involved in with Max (Dr. Majireck – Hamilton College) and it has been great collaborating with him on our research projects.

Hopefully, after a two-year lapse, Dr. Kriley and his students (along with others in the department) will be able to attend the Spring ACS meeting to present some of their work.

Chemistry Faculty – A COVID year

Reflections on the academic year

The 2020-2021 academic year approached, from the faculty perspective, with mixed emotions and incredible preparation. The College decided early on that we would proceed with in-person instruction but also accommodate for students who were not able to attend classes or labs based on quarantine status. Over the summer, we as faculty enhanced and expanded our training with the online teaching tools and adjusted our syllabi and class schedules to prepare for the semester.

Our main online teaching tool has been Microsoft Teams (for video meetings), along with the whole Microsoft suite of programs. With the rapid transition to online learning, our department was assigned a mentor to help us, and we were blessed to have the expertise of Dr. Vince DiStasi '88, a former member of the department. We also used the College's learning management system to aid in the hybrid learning initiative, and faculty also got creative about making all content accessible online by creating videos, websites, and more. A few weeks before the semester started, cameras and microphones were installed in every classroom and lab to help us broadcast our lectures and other content to students who would inevitably be in quarantine and unable to attend class in person. Our faculty took on the challenge of learning how to implement the new technology and modes of teaching with grace, even on the hard days.

The semester started off relatively smoothly. Each professor took his or her own approach as to how to deliver lectures and content, hold office hours, or conduct labs. If felt like we were all learning as we went. Most faculty had to get used to setting up the tech before class - online Teams meetings, screen sharing, online notes, recording, etc. With only a few minutes between classes, this could be challenging and inevitably there was some glitch or missed step nearly every day. The students were patient with us, though. As we approached the third week of classes, the first COVID cases arrived on campus and the quarantines began, pushing us into full on hybrid mode.

Overall, the students' attitude was appreciative of the hybrid mode, especially when they were in quarantine. They were patient, though it was frustrating for everyone when the technology didn't cooperate. Students appreciated the ability to still be in class and at GCC, even with the new restrictions and rules. Quarantine lists and case counts remained manageable until about mid-October. Case counts jumped, more and more students were out of class, and everyone was exhausted from not having any breaks. It was amazing how much we learned to appreciate our fall break, and one or two days off from class here and there!

Students started to leave for home before Thanksgiving, depending on their quarantine status; it felt like an especially chaotic time. Keeping track of who was in class or who was online was getting harder and harder, especially when faculty gave exams or quizzes. But in some ways, it was a relief to make it to Thanksgiving break. All classes and final exams were given online after the holiday.

The fall semester was exhausting for many faculty members. After a challenging spring 2020 semester, the fall semester followed suit in that it felt like we were always on call, always adapting, always working the next problem. The winter break came with a wave of relief.

The spring semester began a week later than normal as the adjustments to the academic calendar eliminated the normal spring break and instead allowed for a week off around Easter. We began the semester immediately with students learning in hybrid mode. Over the course of the first weeks of the spring semester, COVID cases were higher, and more students were in quarantine than much of the fall, but we adapted to this adjusted normal way of operating once again. We did our best to keep track of students not in class, athletes now competing again, make up labs, recorded lectures, and more. By the grace of God, we all made it to Easter recess and a much-needed break. And after that, graduation was just around the corner. Everyone held on through four weeks, through more quarantine periods, through more hybrid learning, until we reached finals week. Everyone was tired, everyone was ready, everyone was just holding on. But at the end, I think we can all say we are proud of how we made it through this incredible year, students and faculty alike. The days were long, the way was narrow, but we made it through.

One of the most rewarding parts of the semester was the culmination of all our work in celebrating not one, but two graduations. While the idea of sitting through two ceremonies was exhausting, it was still incredibly rewarding to watch our students walk across the stage. Even more than that, before each graduation ceremony the Chemistry department faculty invites the graduates and their families for some coffee, donuts, and conversation. It was a very special time this year in particular to express our pride in our students who have made it through a challenging few years and have done so with such perseverance and excellence. In addition, we were able to see, in person, 11 of 15 graduates from the Class of 2020. It was a unique opportunity to see what they have been up to in the last year, post-graduation.

Despite all of the challenges of the last academic year, I think we can, as a department, be proud of how we helped students continue to learn and thrive. Students still participated in research, worked on lab projects, served as teaching assistants, and completed course work. Faculty provided mentoring, research opportunities, flexibility and the same quality of teaching and increased creativity.

The thing that got us all, students and faculty and staff alike, through the semester – the inner strength of God's power and His infinite grace. Grace in the unknown, perseverance in trial, endurance in the race. We would be remiss to not recognize, and remember, who saw us through the storm. Our wish, our prayer, for you reading this, is that you can remember God's grace through this last year as well, whatever your own story is.

I leave you with the blessing we have often heard this year, but still rings true.

"The Lord bless you and keep you; the Lord make his face shine on you and be gracious to you; the Lord turn his face toward you and give you peace." - Numbers 6: 24-26