

FACULTY AND STAFF ACTIVITIES

David G. Alberg, 1993-, Professor. B.A., Carleton College; Ph.D., University of California, Berkeley.

As I write to you, I'm in the process of moving into my office in Carleton's new science building, Anderson Hall! It's exciting, but I am getting a bit tired of unpacking an embarrassing number of boxes (I'm a bit of a pack rat) – boxes that I just finished taping shut a week ago. Despite working in temporary spaces these past two years – with our offices in Old Music Hall, our teaching labs in Hulings Hall, and research labs in the basement of Olin Hall – it is rather remarkable how well everything worked. There really was little of significance in our teaching program which had to be sacrificed, which is largely due to the efforts of our outstanding laboratory staff, Lanhao Yang and Julie Karg. We are now looking forward to opening the new academic year in our new offices and labs!

I enjoyed a pretty typical year in the classroom – teaching Organic Chemistry I in the Fall and Winter terms, and Spectrometric Characterization of Chemical Compounds this past Spring. A highlight of my year was co-leading a comps group with Joe Chihade and working with a talented group of 8 senior comps students. Our group studied the work of Carleton alum, Professor Carol Fierke ('78), who spent much of her career at the University of Michigan and is currently the provost at Texas A&M University. The group focused on Professor Fierke's work on RNase P, an enzyme responsible for the processing of tRNA molecules. The group did a marvelous job and we enjoyed welcoming Professor Fierke back to campus this spring for stimulating discussions with the comps group, and to give the 2019 Jerry and Jean Mohrig Lecture in Chemistry.

Gretchen Hofmeister and I continue to collaborate on research projects in organocatalysis. We spent the past year tying up several loose ends on a project involving the organocatalytic desymmetrization of achiral anhydrides, using cinchona alkaloid catalysts. David Byun ('20) completed several crucial control experiments we needed to perform, and we are now in a position to wrap up a manuscript on this work. This past year I also began a collaboration with Carleton alum, Sarah Hamm-Alvarez ('86), from the Department of Ophthalmology in the USC Roski Eye Institute. One aspect of Sarah's current research focusses on Sjögren's syndrome, an autoimmune disease that targets the tear and salivary glands. Her group identified the protease enzyme, cathepsin S, as a potential biomarker for the disease, as well as a possible target for treatment. Tess Severson ('20) worked in my lab this past year on the synthesis of a cathepsin S inhibitor, which we completed this past April and sent to Sarah's group for biological studies.

On the home front, our daughter Ellie (21) just graduated from Occidental College this spring, with majors in Religious Studies and Spanish. I think we have lost her to California for good. She's decided to stay in Los Angeles, at least for the year. Our son Sam (25) is also in California, and for the past three years has worked at the San Francisco-based biotech start-up company called Benchling. After 3 exciting but very intense years, he has decided to leave Benchling and is currently contemplating his next steps.

With our research labs still under construction, Gretchen and I will have some time for a little travel this summer. In July, we are heading to Denmark, to visit friends we made while on sabbatical at Aarhus University, in 2008-2009. After a couple of weeks in Denmark we will spend a week hiking in the Faroe Islands! We're very excited about that, and I will tell you about it in next year's annual report!

Christopher Calderone, 2012 – Associate Professor. B.S., University of Chicago; M.Phil., Cambridge University; Ph.D., Harvard University.

Though I was disappointed that our shared lab with Joe Chihade and Rou-Jia Sung was shut down for renovations this past summer, and a chunk of the year was spent packing up equipment and supplies, I'm very excited to move in to the refreshed and updated lab, complete with brand new write-up space. Of course, the highlight of the year was moving into the department's new digs in Evelyn M. Anderson Hall, and the whole faculty can't wait to see what life will be like in this new beautiful building.

Though we're all thrilled to see the light at the end of the tunnel of lab and office construction and renovation, the big news (for me, at least) is that I was granted tenure this past winter. It is an unbelievable sense of relief that I'll be able to spend the rest of my career at Carleton and with my colleagues and the students in the chemistry department.

I got to teach my usual stable of courses this past year (Biological Chemistry and Biological Chemistry Laboratory, Principles of Chemistry) with the addition of a small seminar on Chemical Biology. In the lab, David Galambos ('20) got to present a poster describing the research he has been doing in the group at the spring meeting of the American Society of Biochemistry and Molecular Biology in San Diego.

Charles H. Carlin, 1966-2004; Charles "Jim" and Marjorie Kade Professor of the Sciences, Emeritus, 2004-. B.A., Carthage College; Ph.D., The Johns Hopkins University.

This was NOT an eventful year for me. Pain, therapy, becoming a great-grandfather, grandchildren galore at home during the summers, avoiding TV political news, poker games with fellow geezers, monthly gamma globulin infusions to keep the CIDP at bay, and physical exams that reveal the ravages of age but not much disease-related decay -- yet.

My brightest moments come from occasional email comments sent by Chemistry alums - where you are in life, memories of Carleton, your joys and dreams, and what is afoot in your world.

Marion E. Cass, 1987-, Professor Emeritus of Chemistry. B.S. Fort Lewis College, Durango Colorado, Ph.D., University of Colorado at Boulder.

Spring Term 2019 was officially my final term of teaching at Carleton. I am deeply thankful that I have had the opportunity to work with fantastic students and colleagues over the last 32 years. I will greatly miss teaching, my colleagues and the Carleton students at the same time I embrace reinventing myself for the next phase ahead.

In the spring I taught, the Chem 352 (Advanced Inorganic Chemistry Laboratory) with my colleague Matt Whited, Chemistry 359 (Molecular Orbital Theory) and an experimental 2 credit seminar in Molecular Visualizations. I loved teaching all three courses and hope to continue to contribute to the field of teaching inorganic chemistry, molecular orbital theory and molecular visualizations through my work with IONiC, the Interactive Online Network of Inorganic Chemists.

At the end of spring term, we celebrated my retirement with chemistry colleagues at Red Barn Pizza in a wonderful low-key event. Steve Drew donned his late 1990s departmentally issued nose and glasses to say a few words and we all toasted what an amazing experience it has been for all of us to be part of the Chemistry Department at Carleton.

I returned for reunion in mid-June to reconnect with alums and I now feel that I am also an alum of Carleton. It was a wonderful two days reconnecting with many alums and colleagues who have been dear friends over the years. My reunion host (Chris Larson, 89), Kevin and Lisa Freeman Cook (both 94) Tommy Adams (04) and Mike Richards (89) and I spent a few hours reminiscing with Chuck Carlin and we laughed about how two "Chuckisms" stuck with us through our careers. The first (more or less), "if you are trying to propose a mechanism and are stuck where to begin, hell, just protonate something" and the second (more or less), "any idiot can synthesize something, but it takes a real chemist to sort the fly %&* from the pepper".

As I write this, I am back in NH still working away on our energy efficient house. Most days I am wearing a tool belt and chipping away at tasks to

finish. Every day is some combination of challenge, fun, frustration and hard work, not unlike work as a chemist. Steve is working now as the Director of Research at the newly founded Irving Institute for Energy and Society at Dartmouth College although he also is a construction worker on our project on weekends, early mornings and evenings. Ada entices us away from our project for a walk in the woods or a swim in the ponds whenever possible. Much love to all of you from this side of the country.

Joseph W. Chihade, 2003-, Professor and Chair. B.A., Oberlin College; M.A., Ph.D., Columbia University.

It feels as if it has been a very busy year, despite the fact that I only really taught full time during the Fall term. Chairing the department, research, and campus service once again kept me plenty busy.

Last summer, the two returning students in my research group – Jacob Heath '19 and Hannah Kennicott '20 – were joined by Clara McCurdy '19, Kyle Duplessis '20, and Ian McCarthy '20. The group continued work on a couple of projects related to the human mitochondrial alanyl-tRNA synthetase. Jacob, Kyle, and Ian experimented with developing a continuous spectrophotometric assay for tRNA aminoacylation, while Hannah and Clara were looking at expression levels of pathogenic mutants of the enzyme. In the fall, Jessica Makori '20 rejoined the lab and initiated a collaborative project with Rou-Jia Sung in the Biology department, looking at expression of these mutants in human cell culture. The whole lab traveled to Orlando this spring to present two posters and the annual meeting of the American Society for Biochemistry and Molecular Biology. The other conference I travelled to this year was the 27th international meeting on tRNA biology, which brought me back to Strasbourg, France in September. It was lovely to reconnect with old friends and colleagues there, and to learn about a lot of exciting science at the same time.

Attending the tRNA meeting also set me up very well for the comps group that Dave Alberg and I directed in the winter and spring terms. The group studied the work of Carol Fierke '78, focusing on RNase P, an enzyme that plays a crucial role in creating functional tRNAs. Most of the other teaching that I did this year was in the fall – co-teaching the Chemical Kinetics lab with Deborah Gross while also doing the lecture portion for one section of Chem 233. In the spring I just covered one lab section of Chem 234.

This was my last year as department chair. I'll be glad to pass on the responsibility for things like answering emails about pre-requisites and setting department meeting agendas to Dani Kohen, who will take over the position this summer, but it has been interesting to get more perspective on the ins and outs of the department and to help to shape its future. Aside from being department chair, the other reason that I taught relatively few courses this

year was my role as faculty co-chair of CEDI, Carleton's Community, Equity, and Diversity Initiative. My second year in this position had a bit less drama than my first, but still provided many opportunities to make connections across the college, especially with colleagues in Student Life – folks who do so much important work for our students that is often invisible to faculty.

At home, we're still very much in the teenage years. Both kids are now in high school. Margo was a sophomore, taking (and loving) her first AP classes, while Sofia was a freshman, getting used to the routines and higher expectations of the new school, making some new friends, and joining the varsity alpine ski team in the winter. As usual, we did manage to get away a bit this year. Certainly, the most memorable trip was a week-long Alaska cruise with my parents and siblings. Amazing views of glaciers, zip-lining, helicopter rides, kayaking on a lake in the Yukon, and wearing the tuxedo I'd worn at my wedding to the ship's "formal dinner" were among the highlights. We also managed a couple of ski trips - one to Lutsen over Christmas break and another to Lake Tahoe over Spring Break. If I keep this up, I might be a decent skier eventually! This spring, the girls and I did a quick trip to Oberlin for my 30th college reunion. It was great to catch up with some classmates I've been in touch with and others I hadn't seen since we graduated. I've had lots to reflect on this year, and have much to look forward to for the next one.

William C. Child, Jr., 1956-1990; Emeritus Professor, 1990-. B.A., Oberlin College; Ph.D., University of Wisconsin.

In January Nancy and I took a long anticipated trip to Hawaii, visiting four islands. Conducted by the Road Scholar program, it was expertly led and truly educational. It was the highlight of many travels throughout my years of retirement. Nancy's fall and pelvis fracture in late June has kept us close to home in recent months, but we plan in-state trips with opportunities for my photography and Nancy's sketching. The opening of the new science building is exciting; my teaching and research flourish.

Steven M. Drew, 1991-, Professor. B.A., St. John's University; Ph.D., University of Colorado.

Goodbye Old Music Hall. Hello Evelyn Anderson Hall. RIP Mudd Hall.

This year I taught a nice mix of 100-, 200- and 300-level courses. In the fall I taught *Principles of Chemistry II* (CHEM 224) for the second time. After two years, CHEM 224 is becoming well established in our curriculum after it replaced *Equilibrium and Analysis* (CHEM 230) in 2017. In the winter, I taught *Concepts of Chemistry* (CHEM 113) to a receptive group on non-science majors. In the spring, I had the pleasure of teaching our 300-level *Instrumental Chemical Analysis* (CHEM 330) course and its associated laboratory. This has become one of my favorite courses to teach.

Last summer I traveled with my wife Mary to Sweden to celebrate our 30th wedding anniversary. It was a very relaxing three-week trip, with some time traveling the country on our own, plus time with my sister's family. Once back in Northfield I worked on a writing project that culminated in a *Journal of Chemical Education* article on our application of pulsed LEDs in the study of luminescence decay kinetics.

During the school year, Cullen Irvine ('19) and Tristan Pitt ('19) continued our work on applying our 2D photocurrent scanning station to the study of thin film mixed metal oxide semiconductors we make using our inexpensive restricted evaporation technique. As a test case, they made thin films of a mixed metal oxide containing iron, chromium, and aluminum, then investigated the deposition conditions that led to either an n-type semiconductor or a p-type semiconductor. Cullen and Tristan mapped out the film's dependence on the ammonia concentration of the initial colloid deposition solution. In addition to their photoelectrochemical studies of the films, they also initiated SEM and XRD studies that will be very useful in elucidating the materials properties of the thin film semiconductors we have made.

Tricia A. Ferrett, 1990-, Professor. B.A., Grinnell College; Ph.D., University of California, Berkeley.

We are at last (!) in Anderson Hall, over a decade in the making. Life is good. We watched it come together during construction last year, moved in during the summer, and fall term has launched in our new spaces. Flowers are in some public spaces nearby, thanks to our Chair Dani. It will take us a while to bring this building and all the learning in it fully alive. Already, it is a vastly improved and modern place for science learning and teaching!

I was on leave (personal and family) most of the 2018-19 academic year. I taught winter term with Will Hollingsworth, Spec Lab Chem 302, with the usual group of talented and lively chemistry majors. The highlight of my year was the winter/spring comps experience with Prof. Cherie Kagan (U. Penn), who does work on developing solution- and solid-phase chemistries that improve electrical conductivity in a range of nanocrystalline devices, including transistors. The comps group of seniors ('19) - Eavan Donovan, Ben Greenvall, Cullen Irvine, Casey Lee-Foss, Adam Nijhawan, and Zoya Siddiqui – persevered through what they fondly called the “first electrical engineering chemistry comps”! We wandered through a research land strewn with strategies to reduce the distance between crystals and to cleverly modify surface chemistry. This was all aimed at paving the way for fast electron mobility in electronics devices. Cherie's visit was everything we had hoped for, and more. By the end, I think we were all dreaming of the speedy blue electrons traversing the valence and conduction bands of semiconductors.

In Jan. 2019, I attended the American Colleges of the Midwest (ACM) conference on “Opportunities and Challenges in Place-Based, Interdisciplinary Learning”. This was a final conference aimed at synthesizing years of faculty project work funded by the ACM SAIL seminars (I attended 2 over the last 4 years). I led a discussion on the pedagogies of place-based learning, and I even let ACM make a video of me talking about my project work. ACM has funded development of my two courses in environmental studies (Abrupt Climate Change, Mining & the Environment) – to which I added a term-long team and campus-based project and an enhanced experiential field trip in N. MN. These days and up to retirement, most of my development as a teacher will be pointed in these directions – further developing highly interdisciplinary learning and teaching around controversial, ill-structured, complex problems that require integration of perspectives from science, economics, politics, policy, history, and more.

This year, I am back teaching every term, something I have not done for several years. I am so happy to be back, doing what I love.

Outside of work, my partner Gerard and I continue to enjoy biking. Somehow, I am also running as fast as I was 5 years ago after working with a personal trainer and physical therapist to deal with a recurring and mild (but annoying) left hip/leg pain. I have been visiting Fort Collins, CO often - where my mom and 2 brothers now live after a big move for Mom (now 88) from Kansas City last summer. At home, we got a crazed puppy named Indie. He is a black lab, terrier, whippet mix and dominates our lives in a good way. My teen Korean boys are in 11th and 12th grade. Their challenges related to adoption (and more) still dominate my life, but the empty nest is within sight. Travel was quite limited this year due to family constraints, but we hope it returns to normal next year!

James E. Finholt, 1960-2001; William H. Laird Professor of Chemistry and the Liberal Arts, Emeritus, 2001-. B.A., St. Olaf College; Ph.D., University of California, Berkeley.

Deborah S. Gross, 1998-, Professor. B.A., Haverford College; Ph.D., University of California, Berkeley.

I am writing this while surrounded by boxes – we’re packing up for the second, and hopefully the last, time in as many years. We anticipate the move into our new building over the next few weeks, and I, for one, can say that I am very much looking forward to the new spaces and new opportunities that we will discover there. These changes in the department are welcome, but tempered by the recent retirement of our colleague Marion Cass, who will be sorely missed.

That said, it’s been a good year for me, although busy. It really started last August, when I had the great pleasure of taking 6 students with me for a two-

week trip to Addis Ababa, Ethiopia. Five of the students were in my Spring 2018 ENTS course, Climate Change and Human Health, and we had a combination of grant support from the U.S. Embassy in Ethiopia and the Dean of the College to bring them to do a hands-on case study on climate and health issues related to cooking. All of this work was in collaboration with ENTS Professor Tsegaye Nega. I also brought one of my research students, Clarissa Smith ('19), who has done a lot of work with cookstove emissions over the past few years. The six students did tremendous work, introducing 10 families to cookstoves, training and supporting them as they learned how to use them, and learning for themselves how climate issues, health issues, and personal economic and social concerns intertwine. This trip was so successful that we have been approved to co-lead a winter-break off-campus program in 2020, to do related work!

In the fall, I co-taught CHEM 301, Chemical Kinetics Laboratory, with Joe Chihade, and we had a good group of students and lots of fun projects. I also taught the FOCUS Colloquium for the first-year FOCUS cohort that started in the fall. In the winter, I taught two FOCUS Colloquia – one for the first years that started in the fall and the other for the first-year cohort that started in the winter. Both groups met independently, but we worked on a research project collaboratively. The students spent much of the term working on analysis of the surface area of activated charcoal generated from the cookstoves I've been working with in my research. In the spring, I taught a new course (for me), CHEM 224, Principles of Chemistry II. This course replaces Equilibrium and Analysis, which I have taught more times than I can count. It was really fun to get to re-assess the content that was in common between these courses, and to think about how to teach topics that I have not taught before. Although the class was quite large by Carleton standards (68 students, 3 lab sections), I think we all had fun, and the students did great.

In addition to my formal teaching, I supervised a lot of independent studies this year, including:

- Working with Naseem Dillman-Hasso, who took my Climate Change and Human Health class, on a project to understand the connections between climate change and mental health – the project started over winter break, continued in the winter and spring terms, and will continue next year. Naseem has learned a great deal, and I am learning new things to include in the next offering of that course!
- Exploring the connections between cooking and science with Jonah Kan, Nick Vetterli, and Anna Lauko, three senior chemistry majors (and joined by David Higgs, the FOCUS 5th Year Intern), where we focused on topics such as the best way to temper chocolate (leading to a Young Chefs lesson plan), getting sourdough starters started and making bread, figuring out the optimal time to let chocolate chip cookie dough rest before baking the cookies (48 hours – the taste test for this was pretty great!), exploring the differences between chicken

and duck eggs when making meringues, crème brûlée, ice cream, and angel food cake, and more. It was delicious and fun, and we all learned a lot.

- Developing resources that will be useful for the ongoing cookstove project in Ethiopia with the students who traveled there last summer. In the fall, the 6 students put together a presentation to give to anyone on campus who was interested, and they spoke to a packed room while offering a light lunch of Miser Wat (lentils) cooked on the cookstove. In winter and spring, the students continued to develop resources related to both uses of activated charcoal and entering the carbon market, which is something that might be in the future for this project. It was great to keep working with these students who I got to know quite well on our trip in the summer.

Add to this my research group (Austin Heuer '19, Nick Vetterli '19, and Amelia Broman '21), who spent some time working on analysis of water samples from abandoned mines, using our single-particle mass spectrometers and the ICP-MS, and an individual comps paper, and I found it was hard to keep up with all of the meetings, but they were all interesting.

Otherwise, I have continued to direct the FOCUS program, and working with David Higgs this year as the FOCUS 5th Year Intern was tremendous. The program is going strong, and we are poised to welcome our fourth “double-size” cohort this upcoming year, meaning that there will be ~120 FOCUS students on campus! I never anticipated that the program would be so large, and I am very excited to see how it progresses.

Another highlight of the year was serving as the OCS Faculty Fellow, which meant that I got to interact with some of the students who participated in non-Carleton off-campus programs that involved independent and/or field research. With guidance from the OCS office, I helped them think about ways to connect their work on their programs to work they could do at Carleton, and I was excited to see a number of them present their work in a well-attended, and really well-presented, symposium in the winter! Part of being the OCS Fellow was a chance to visit a program, and I had a wonderful few days visiting the School for Field Studies program in Tanzania. It was a great opportunity to see how the program worked, to meet some wonderful students, staff, and faculty, and to see a beautiful new place that I hope to be able to return to in the future (I hear there's great wildlife just minutes from where I was...).

Outside of work, I have had the chance to do a bit of traveling for fun (Switzerland, Hawai'i), and Markus and I are looking forward to taking advantage of my inability to do research on campus this summer by traveling at an unusual time for us (July).

Gretchen E. Hofmeister, 2002-, Professor. B.A., Carleton College; Ph.D., University of California, Berkeley.

I am now finishing year three of a four-year position as Associate Dean and my work in that role has taken me out of the classroom for a while. My responsibilities primarily include oversight of academic budgets and academic facilities. In particular, I am deeply involved in construction of the new Integrated Science Facility. We reached an important milestone last week, when Evelyn M. Anderson Hall opened to the public! The East Energy Station is housed in the sub-basement of Anderson and also came online this summer. Hulings is being renovated in stages during summers and breaks. This past summer, the big accomplishments were replacing the mechanical systems in the penthouse and installing a new open staircase in the atrium. This required opening up the Hulings roof and moving equipment out and in by crane. Olin is now empty and undergoing renovations. Psychology has moved their labs to the lower level of the old Music and Drama Center. Psychology and Physics offices are in Old Music Hall.

One of my other projects is Post-Science Space Planning, which is addressing the plans for Old Music Hall and CMC after the science project is complete and Computer Science moves to Olin. In addition, I am working with Carleton's new STEM Program Manager, Stephanie Schroeder, and the STEM Board Director, Amy Csizmar-Dalal, to develop more integrated programming in STEM. I have gotten to know many different staff, faculty, administrators, and board members in this role. I now have a better appreciation for all of the roles that different constituents play at the college.

In research, Dave Alberg and I continue our collaboration in organocatalysis, which involves using small chiral organic molecules as catalysts for stereoselective organic transformations. David Byun ('20) has been doing research with us, helping to address some lingering questions regarding the mechanism of an organocatalytic desymmetrization of a citric acid derivative. Specifically, he is doing some experiments in order to confirm and interpret our observation of a linear correlation between enantiomeric ratio and the electronic character of the nucleophile in this reaction.

Associate Professor of Physics Marty Baylor and I continued a joint project with chemistry student Casey Lee-Foss ('19) and 5th year intern T. J. Lynch ('18), using NMR to measure the gel point of photopolymers that Marty uses to create optical devices. Detecting the gel point, when using different pre-polymer formulations or polymerization times, is critical for identifying the optimal conditions to embed optical channels in the polymer. We identified a method that seems accurate and reproducible, and we now need to focus on publishing this work.

I just started my third year with the Master Swimmers group, the Knightcrawlers. It has been an adjustment to get in the pool at 5:15 AM three days a week, but it is a great workout and I still can get to the office by eight. We attended Ellie's graduation from Occidental College this past spring; we are now officially empty nesters! Sam is currently traveling in South America and Ellie is working in L.A. It would be great to see you if you return to campus. I would be particularly happy to give you a tour of the new science building!

William E. Hollingsworth, 1986-, Professor. B.S., B.A., University of Texas, Austin; M.S., Ph.D., University of California, Berkeley.

Will's plan was to have a quiet uneventful year. After a year in transition space and suffering one of the worst winter commutes by far, 2018-19 would be a good year to cash in some sabbatical time in anticipation of the final moves of lab and office to Anderson Hall. The plan was to teach in the winter and during the fall and spring terms to work on projects such as popularizing the introductory environmental class that he developed and has taught for many years; with the recent focus on global issues such as climate change, Will has had increasing inquiries from others interested in teaching similar classes. The plan was also to spend a bit more time during the year traveling. This was accomplished with a terrific winter-break vacation to Vietnam and Cambodia and a trip in the spring to southern California to hang out and imagine what it might be like to retire some day soon and spend time in warmer locations.

As fate would have it, however, big events of the unwelcome kind intruded throughout the year. In the fall, after many years of declining health, Will's mother died in Texas. He went there several times to help his brothers clean up and sell the family home as well as for the memorial service. In the spring, his wife was diagnosed with a dangerous spinal condition that necessitated serious surgery and months of recovery and adjustment. The recovery is still in progress but all signs look positive and Will was relieved to be able to resume his full teaching load this fall.

While at Carleton during the 2018-19 year, in addition to packing up and moving Will taught quantum mechanics and did the associated spectroscopy lab with Trish. He also enjoyed participating in an appointed campus committee doing long-range planning for circulation patterns on campus. He also prepared solutions for high school teachers coming for a week in the summer for enrichment teaching and lab topics.

Now that 2019-2020 has begun and everyone is getting settled and enjoying the new teaching and laboratory spaces, things are stabilizing to a new normal. Will is looking forward to a fall of teaching intro chem and a new activity working with the latest group of FOCUS students for the next two years.

Julie Karg, 1988-, Chemistry Technician. B.S., Mankato State University.

Academic year 2018-2019 was year 2 of a 2-year transition period occupying temporary spaces in Hulings Hall, Olin Hall, and Old Music Hall, after vacating Mudd Hall and before moving into Anderson Hall. Much time was spent planning and packing for the move into Anderson Hall. This process needed to occur in numerous phases, each having a very tight and restrictive timeline. My student workers and I labored tirelessly all of spring term packing, organizing and staging boxes for the move, and we were able to complete all necessary tasks with just hours to spare until the last deadline.

Daniela Kohen, 2002-, Associate Professor. B.A., Universidad de Buenos Aires, Argentina; Ph.D., University of Notre Dame.

This was an extra teaching year! After teaching thermo in the fall, I ended up teaching intro chem both in the winter and the spring terms (5 lab sections in total). I also continued to mentor FOCUS students in their sophomore year, and was able to guide a COMPS group. It was a lot of work, but so much fun – I do really LOVE teaching our students!

FOCUS is a curriculum-based cohort program developed by Deborah Gross. It targets students interested in science and math who come from groups traditionally under-represented in STEM fields. As their teacher I was part of a team that provided community, support, and academic opportunities for its members while encouraging the pursuit of science and math careers. This past year, the 2nd year FOCUS cohort collaborated with the Northfield Community as residents developed the Northfield Climate Action Plan. Contributing to this effort was a challenging and rewarding experience for us all. In the winter Matt and I also co-supervised a “Comps” group that studied the work of Jeff Long, from UC Berkeley. The group spent about 12 weeks learning how Long's group designs and characterizes Metal Organic Framework materials, with gas storage and separation applications in mind. It was a great to share such an interesting subject with such a group of enthusiastic and talented students, and a wonderful visit with Jeff was just the perfect ending to the experience.

Doing research with undergraduate collaborators has also been a pleasure. During the year Adam Nijhawan ('19) continued to study zeolites (molecular sieves). The goal of these studies is to provide a basic understanding of the processes that underlie the use of molecular sieves as filters to remove CO₂ from the atmosphere. In some of these materials, cations act as selective trapdoors, allowing carbon dioxide but no other gases to diffuse through. Computer simulations are allowing us to gather microscopic insight into this interesting behavior. I also continue to directly collaborate with experimentalists as I venture into the world of quantum chemistry. Will DeSnoo ('19) and Anna Conley ('20) continued to use computational methods to investigate mechanism and reactivity in the systems that the Whited group

studies. This summer, as you are aware, we are in the process of moving to Evelyn Anderson Hall so the Chemistry department decided not to have a summer research program. I look forward to collaborating with students over the year, but even more over the 2020 summer! To prepare for a productive next year, and knowing that time would be even more precious next year, when I begin my three-year stint as a chair of the department, I did my best to secure funding. I am super pleased that the NSF decided to fund my group's zeolite research work and the purchase of a computer cluster for the Midwest Undergraduate Computational Chemistry Consortium (MU3C). It is wonderful to have such great partners while doing research: my students, other professors in the department, and the many members of MU3C!

Family life is good too. Margo (almost 17) and Sofia (almost 15) are pretty great, so we all continue to enjoy each other quite a lot!

Tamara Little, 2016-; administrative assistant for Chemistry and Geology. 1996-2016 administrative assistant for AMST/ENTS/LING adding WGST (2007-2016).

This past year found us getting ready to move out of Old Music Hall and into the new Evelyn M. Anderson Hall with much needed assistance from student employees Alison Block, Talia Kottler and Nghi Lam. I so appreciated all their help throughout the Music building. From our arrival in Anderson Hall on June 20th and into August, we were coming to work in hard hats, safety vests, closed-toe boots, t-shirts and long pants. Some days were pretty hot in the new building as the hvac wasn't quite ready for our arrival. But my new office comes with a great view from the 3rd floor and plenty of sunshine.

I had been the compiler of content for the *Annual Report* and for *The Weekly Beaker*, I managed the department's website with the transition to WordPress and was the purchaser of a steady supply of cookies for the Chemistry Seminars, along with my usual office duties this past year. Many, many thanks to Brenda Norberg for pulling this year's Annual Report together, along with subbing for me to assist the Chemistry and Geology departments. The summer of 2019 changed considerably for me requiring her assistance to get all things done this past summer from August into Fall. But I plan to be back in November. Stop by and find us when you are on campus.

Jerry R. Mohrig, 1967-2003; Herman and Gertrude Mosier Stark Professor of the Natural Sciences, Emeritus, 2003-. B.S., University of Michigan; Ph.D., University of Colorado.

This was a year for cutting back. I finished my terms on the board of the Cannon Valley Elder Collegium (CVEC), the Cannon Village Gardens (and resigned my term as chair) and sold my car. I bought a three-wheel electric

scooter instead. I continue to serve on the CVEC committee for the outreach to Faribault. The fall saw me again teaching my CVEC course on the history and chemistry of chocolate. While I couldn't stand for two hours and sitting meant I read most of my notes, there were good discussions.

In June I had a good time at the Carleton Reunion, having dinner with two classes. I have had the good fortune to be able to keep up with many alums. There were two memorable moments involving alums during the year. The development office called to set up an appointment. They told me that Sarah Kelly '81 wanted to make a major gift to the college for the new science building (a great addition by the way). Sarah wanted to give it in my name. So there is now a student gathering place, without faculty involvement, in the new building. The second moment was at breakfast with Richard Roberts '72 and Chris Green '73. They told me that they, along with Jay Knowles '85 and Randy King '88, have set up the beginnings of an endowment for undergraduate research in my name. I have often said that teaching involves deferred gratification. If you live long enough, it comes true.

In my spare time I reviewed articles for the Journal of Chemical Education. Walking with my friend and former colleague Bill Child and conversations with good friends rounded out my activities.

Richard W. Ramette, 1954-1990; Laurence M. Gould Professor of the Natural Sciences, Emeritus, 1990-. B.A., Wesleyan University; Ph.D., University of Minnesota.

I'm happily living a simple, uncluttered life in a retirement community in Green Valley, AZ. Over the past year I became enamored of Tanka, an ancient Japanese poetry form.

ODE TO THE CLASS OF 1959

I find that aging
employs memory filters
that favor the best.
In my case I still treasure
those Carleton 1950s.

Everything was new,
and when I woke each morning
I knew a good day
was waiting at Leighton Hall
with those wonderful students.

We young professors
thought Carleton College was the

end of the rainbow,
with President Laurence Gould
as our guide to the future.

We and the students
could not possibly conceive
that six decades on
we would gather on campus
to bask in those memories,

while reflecting that
no matter how well Carleton
persists to this day,
we knew it when, long ago,
it was truly at its best.

Tanka, April 2019 by
Richard W. Ramette
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Matthew T. Whited, 2010-, Associate Professor. B.A., Davidson College; Ph.D., California Institute of Technology.

The past year was a wonderful one in many ways, but for me (as for my colleagues) it seemed to be dominated by the tension of continuing to work in a temporary space while getting ready to move into our sweet new digs! I taught a familiar set of classes, but with a couple of twists. In fall, I had the opportunity to work with the problem-solving section of CHEM 123 – Principles of Chemistry I for the first time. It was great getting to work so closely with a group of students (in addition to regular meetings, the class has two “problem-solving sessions” per week), and more than anything it made me eager to teach the class again so I can try some things differently with facilitating student group work. I worked with a great group of students in CHEM 358 – Organometallic Chemistry in the winter and received a small grant from the college to work on incorporating “slow teaching” into the course (for me, this meant more time for student reflection and more student-led discussion during class meetings); the changes were a bit painful at times, but I really appreciated the chance to rethink how we engaged the material. Finally, I was able to teach Inorganic Chemistry (CHEM 351) in the spring, co-teaching the lab with Marion in what was (sadly for us) her last term at Carleton. I must say I’ll be a bit lonely teaching this without her next year!

Outside of class, I served with the search committee that hired Art Rodriguez, our new VP and Dean of Admissions and Financial Aid; while we are all sad to see Paul Thiboutot retire, Art is really wonderful and is bringing fantastic new ideas to the College! I continued to chair the Admissions and Financial Aid

Committee at Carleton and worked with the STEM Board, including developing a proposal for a new STEM-wide staff position (and subsequently working on the committee that hired Stephanie Schroeder as our new STEM Program Manager) and developing bylaws for the STEM Board. I also worked closely with the folks in Development as we formally launched the “Every Carl for Carleton” campaign last fall. It was great to see many of you either on the road last year or at Carleton for the campaign launch! The launch coincided with the Celebration of Science in fall 2018, where I chaired a session on “Science, Energy, and the Environment.” I was involved a little more heavily in reviewing this year than in the past, serving on 2 NSF panels (reviewing about 25 proposals) and taking on regular *ad hoc* review work. Nevertheless, I did manage not to travel much, just making a short trip to the Dreyfus Symposium in the fall and a Cottrell Academic Leadership Training workshop in the winter, which helped quite a bit. Still a bit exhausting, but the year gave me lots of great opportunities for networking with colleagues outside Carleton.

As always, I have been thrilled to get a chance to work with a number of students in the lab during the past year: Jim Zhang, Will DeSnoo, Joseph Luther, Anna Conley, Luke Westawker, and Claire Shugart. I am particularly grateful to Jim, who worked all year as a 5th-year Educational Research Associate. He made phenomenal progress: his third paper from Carleton is currently in review and I am starting to write up his fourth (and I think there's one more coming after that)! I am also really grateful for my two years working with Will, who just graduated. Although I was really sad not to have lab space to allow Joseph, Anna, Luke, and Claire to work at Carleton, they all went off and did cool things over the summer and are back to discover some new, cool stuff before graduating in the spring. We have continued to have super productive collaborations with Buck Taylor (now at University of Portland) and Dani Kohen as well as Oleg Ozerov (Texas A&M), and I am grateful for all their insights into our research. I will be spending most of this term writing and setting up my new laboratory, but there are a few seminars (Yale, MIT, and Princeton), so I hope to see many of you when I'm on the road!

On the home front, I continue to be extremely happy to be in Northfield. Our two boys (James and Andrew) are now both at Prairie Creek, getting ready to start Kindergarten and 2nd grade, and Charlotte continues to make phenomenal contributions to the grants work of the College in her job as Grants Coordinator and Compliance Specialist. Taking everything into account, we're even willing to deal with the occasional terrible winter! But we're crossing our fingers that this year isn't as bad as last... we'll see.

Lanhao Yang, 2013-, Laboratory Manager. B.S., Henan Normal University; M.S., Wuhan University; Ph.D., The Ohio State University.

Time flies. It has been another year!

At the end of June, chemistry department moved out of Hulings and Olin halls. Chemicals were moved to Arena Theater until Anderson Hall is ready to receive them, other lab supplies to corresponding rooms in Anderson Hall, though the space is not fully ready yet. Thankfully, the office space is accessible 7:00am-3:30pm Mon-Fri so that I can still work and have a place to go, even though the AC is not up running yet and a fan is needed. I have been eagerly waiting for Anderson Hall to be fully functional. My new office faces south and has a much larger window than the one in Hulings Hall. All furniture is brand new. I even got my wished-for adjustable standing desk! It has been wonderful to work in the new office.

The move was scheduled and planned for since early last school year. To ensure a smooth move, chemistry department dedicated a decent amount of time preparing for it since the winter break. Here I would like to give special thanks to Steve Drew, Julie Karg, Alison Block, and Jamie North. Steve was always available to lend me a hand, including answering my random questions. Julie, Alison, and Jamie went out of their way to help me organize and pack lab supplies. With Alison's help, all supplies—over 200 boxes and items—stored in Phoenix building were sorted, relabeled, and are ready for their final destinations in this August. Besides these aforementioned helpers, I also owe much to everyone else in the department. Without their support, I cannot imagine how the move would go.

In addition to the move, other things went well too. I am grateful for many things. As before, I assisted lab prep for CHEM 224, 234, 301, 302, 306, 321, 331, and 352. During lab sessions or experimental time, from time to time instruments (e.g., iS5 and iS10 IRs, UV/vis, HPLC, and GC-MS) decided to take a break, even the students and instructors could not afford it. Thank God, each time somehow after a quick assessment of the situation and some gentle care, the instrument went back to normal! Here I want to thank all students and instructors who patiently waited for the end of the instrument strike.

In a word, this past school year has been great because of the generous support of the department, my beloved student workers, and many colleagues on campus. I look forward to another successful year in our new building!