

Fall 2014 Issue

ELEMENTS

The Alumni Magazine of the Department of Chemistry at Virginia Tech

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Tell us your story!

Do you have an interesting story that might be featured in Elements? Do you know someone who should be featured? Or, would you simply like to say hello?

Contact the Department Chair,
Prof. Jim Tanko (jtanko@vt.edu)
or
Laurie S. Good, Elements Editor
(laurieg@vt.edu)

The Chair's Corner

J. M. Tanko, December 2014



Welcome to the Fall 2014 edition of Elements! In writing this introduction, I find myself thinking of Charles Dickens, and his haunting introduction to *A Tale of Two Cities*: "It was the best of times, it was the worst of times..." Over the past year, the Department has enjoyed remarkable successes moving towards Virginia Tech's "New Horizon," and during this journey the Department has once again been confronted with human tragedy. In this regard, I must once again report the loss of yet another member of the chemistry family,

Prof. Karen J. Brewer, whose untimely and unexpected passing in October came as a shock to us all.

This issue of Elements has an article dedicated to Karen and her accomplishments. All I can add is my personal thoughts. Karen was the complete package as a faculty member. Her research and scholarship were world class, her outreach activities touched the lives of countless K-12 students, she was a superb teacher and mentor, and an inspiration to us all. Karen was a good friend who will be sorely missed. Sadly, in this issue of Elements, we also note the untimely passing of two of our alums, Dr. Ian "Jake" Chapple and Prof. Marie Krafft, both from cancer.

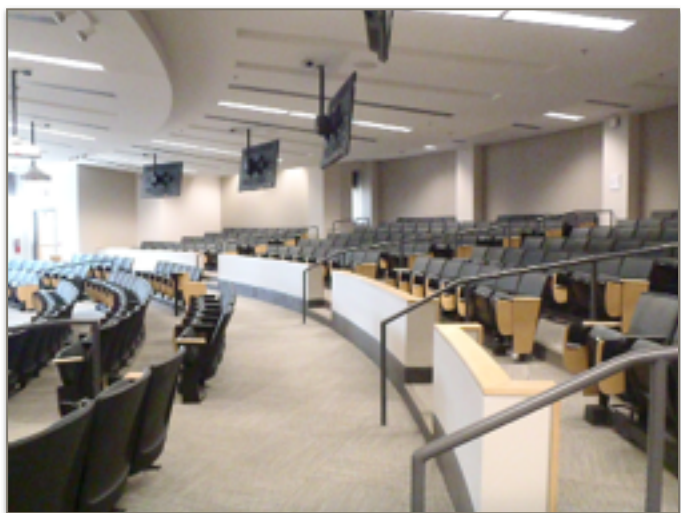
But there is also a lot of good to report. Two of our undergraduates (Mary Cameron Brooks and Brandon Meerscheidt) are profiled in this edition of Elements. With all the disparaging statements about "millennials" in the media these days, upon reading their stories I think you will agree that we can look forward to a very bright future. There is also an intriguing article about one of our alums, Bob Schwerzel, who recently completed his own journey. If you are not familiar with "The Great Loop," read this article... you will be captivated. There is also a profile of one of our recent graduates, Josh Hartsel, whose current research activities are tied to historical societal changes that have led to a new industry.

As you may know, Virginia Tech has a new president, Timothy Sands, and members of the Chemistry faculty had prominent roles in his installation in October. We also feature an article about the recent meeting of the Department of Chemistry Advisory Council (DCAC). DCAC is a volunteer group, composed mostly of chemistry alums that give their time, effort, and more in service to the Department of Chemistry. We are proud to have such a dedicated group working on our behalf, and on a personal level, I am delighted to call these folks friends.

The Chair's Corner...

In this issue, our continuing series about the exploits of former heads and chairs of the Department of Chemistry features Prof. Larry Taylor. This article is particularly timely, and allows me to segue to another topic, the Friends of Larry Taylor Excellence Fund. Alums created this fund in honor of Larry, and the generated income was to be used at the discretion of the department chair. I am delighted to report that we are using the income for a "Friends of Larry Taylor Lectureship." We anticipate an internationally prominent analytical chemist will give the inaugural lecture in this series.

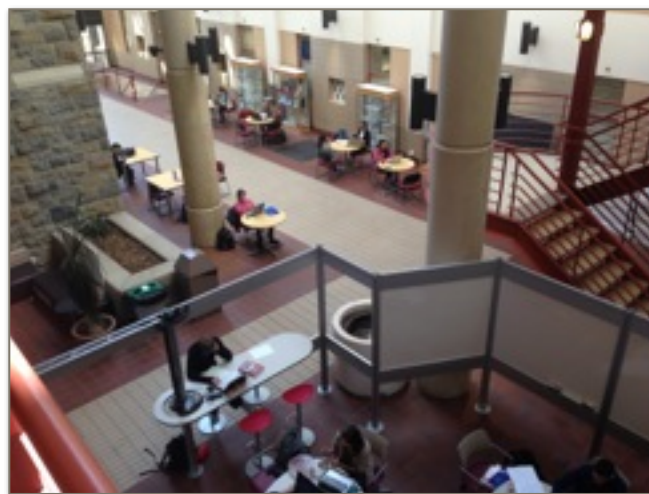
The renovation of Davidson Hall is now *mostly* complete and we have been given the keys to the kingdom. It's anybody's guess as to when Phase II (the renovation of the front section) will get underway, but we don't expect any action until 2015...with luck! As illustrated below, Davidson now features a modern lecture hall that accommodates nearly 350 students. If your travels take you to Blacksburg, I invite you to visit the Department and have a look at our wonderful new facilities.



I also include two photos of our repurposed Hahn Hall Atrium! What was for decades a home for dying potted trees and under-nurtured plants, our Atrium is now a dynamic space for students to study, meet with professors, and recharge their batteries (literally and figuratively). In the near future we will be adding another large television screen to showcase faculty research and post news/events of interest.

Finally, as the front cover of every issue states, **Elements is YOUR alumni magazine**. We love to hear about what VT's growing family of Chem alums are doing around the world. Please keep in touch and share all your good news with us! With a major revamping of the Chemistry website nearly complete, we plan to feature alumni news on an ongoing basis, in addition to publishing them in Elements.

I wish you all the best during the holiday season and throughout the coming year. Look for the Spring Issue in about six months!



Remembering Prof. Karen J. Brewer

1961 — 2014

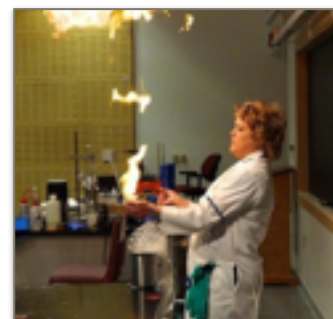
It is with great sadness that the Chemistry Department notes the passing of Professor Karen Jenks Brewer. Karen joined the Virginia Tech faculty in the



Fall of 1992 as an assistant professor after starting her career at Washington State University. She was promoted to the rank of full professor in 2005. Karen's research in the areas of photochemical production of hydrogen gas and the use of supramolecular complexes of

ruthenium, platinum, and rhodium, for the potential treatment of cancers by photodynamic therapy earned her an international reputation as a researcher. Her 100+ peer reviewed research publications have garnered over 3,000 citations and her research pace was as active as ever at the time of her premature death.

From the start of her tenure at Virginia Tech, Karen was a strong advocate for women and minorities in chemistry. She was a role model and mentor for many woman chemistry students and received a College of Arts and Sciences Diversity Award in 1996, shortly after arriving at Tech. She herself was a pioneer as a woman in the physical sciences. She was the second woman on the chemistry faculty when she joined Washington State University and she was only the third woman hired in chemistry at Virginia Tech, and the second woman to obtain tenure in chemistry. Her efforts to promote chemistry as a career choice for women were most evident in her extensive outreach efforts to primary and secondary school students. Throughout her career she regularly visited K-12 classrooms and hosted students in her labs at Virginia Tech. This effort provided a real-life role model for young girls and others with aspirations to work in science. Virginia Tech



recognized her outreach efforts this year with the 2014 Alumni Award for Outreach Excellence that she shared with a former postdoctoral researcher whom she mentored.

Karen was comfortable teaching chemistry at all levels, from first year students in General Chemistry to graduate students in special topics classes on areas such as electrochemistry and the photophysics of transition metal complexes. Her enthusiasm for her subject rubbed off on students and she inspired many to change not only their view of chemistry, but in some cases their major to chemistry.

For all her accomplishments in chemistry, academia, and community outreach, there is little doubt that Karen viewed her greatest achievement to be raising two daughters, Nicole and Kaitlyn, who have grown to be remarkable young women in their own right.

Donations in her memory can be made to the Roanoke Wildlife Rescue; see www.roanokewildlife.org.



Shamindri Arachchige and Karen Brewer, with VT President Tim Sands, upon receiving the 2014 Alumni Award for Outreach Excellence

Life After Herding Chemistry Cats: *Perspectives From Our Former Chairs*

This is another installment in a series of articles on Chemistry's former chairs

Prof. Larry Taylor

Why Retire if You Enjoy What You're Doing



Retirement was something I never really looked forward to—but only because I was defining it in the “traditional” sense of the word. I have since learned that retirement is pretty much an antiquated idea. In fact, I am more active than I ever

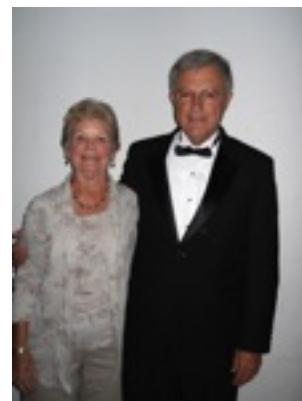
thought I would be and sometimes wonder when I had time to “work” as a chemistry faculty member for 40 years and serve as department chair from 1997 to 2004. But after four decades of teaching over 12,000 undergraduates, mentoring 70 graduate students and interacting with a stellar group of colleagues, I figured it was time to pass the torch. Of course, that decision was made more apparent after I set the carpet on fire in the old Donaldson Brown Center one afternoon and could not put it out, even with help of eager young freshmen! Thus, “retirement” seemed to be a better option for me. I will always miss the students, their passions (and their inventive excuses!). Unlike graduate students, they always laughed at your jokes and marveled at controlled explosions (when awake, of course).

You can still find me on campus most weekday mornings before 7:00 AM in the Surge Building (Room 117), which Prof. Tanko kindly provided for me. It is clean, comfortable, and quiet with copier, printer, and scanner all within eyesight. Who could ask for more? I am still playing singles tennis 2-3 times per week. John Dillard is one of my opponents. Imagine two 70+ chemists trying to hit a tennis ball running around in short pants three days per week. I also joined the Montgomery County-Blacksburg Kiwanis Club, which meets every Thursday for lunch. Apparently, the “leadership thing” didn’t fully dissipate when I stepped down as chair because suddenly I find myself

as President-elect for 2015. It has been an education for me to be part of a non-academic group with whom I am taking food to pre-school children in the county, reading stories to five-year olds, and stirring Brunswick stew...among other challenging tasks. I have also joined the New River Valley Salvation Army Advisory Board. For the last three years you could find me ringing the “Red Kettle” bell outside the Christiansburg WalMart.

Since “retirement” I have become a member of the Green Chemistry Group, which sponsors biennial meetings (alternating between the U.S. and Europe) that deal with supercritical fluid chromatography (SFC) in the pharmaceutical industry. I serve as the Program Chair, since my research group is about the only academic laboratory left in the U.S. that is devoted to SFC. To date, I (with my wife, Gail) have traveled to meetings in Zurich, Brussels, Stockholm, and Basel, Switzerland. In the meantime, I have had consulting opportunities with Pfizer, Waters Corp., and R.J. Reynolds Tobacco Co., which also keep me in the scientific loop.

Gail and I remain heavily involved in the life of the Blacksburg Baptist Church where I have taught Bible study classes each Sunday morning for over 30 years. Our family consists of a son and a married daughter. We have three grandchildren, one of whom is autistic, and a 15-year old dog. We attempt to stay young by taking ballroom dance lessons each Friday night at New River Community College. We get in more play time with friends and extended family by spending 4-5 weeks each year at Ocean Isle Beach, NC. Gardening each summer near our Christiansburg home is a favorite past-time, in spite of the weeds that seem to take over each year. I feel very blessed. In short, in considering my day-to-day “post-retirement” activities, I’m beginning to question why I didn’t think about doing it sooner!



The Art and Muscle of Chemistry

Undergraduate Student Profiles: Mary Cameron Brooks and Brandon Meerscheidt

Laurie S. Good

Mary Cameron Brooks

It literally took generations, but come May 15th Virginia Tech will finally graduate the first student from a local Salem (VA) family that goes back four generations in that area. This is not to say Mary Cameron Brooks can't claim a distinguished academic pedigree; in fact, the first Brooks in the area was the town's doctor, and relatives have since graduated from just about every college/university within 300 miles of here. Except for Virginia Tech...until now.



The daughter of an elementary school teacher (Ann) and a pharmacist (Cameron), Chem major Mary Cameron Brooks entered VT just three years ago as an architecture student, but it wasn't the type of creative program she had expected. Since chemistry was her favorite science in high school, she decided to join the department during the spring semester and has since distinguished herself as a gifted student with interesting career plans—thanks in part to Prof. Gordon Yee. A chance meeting at the local Starbucks, where Mary Cameron expressed some uncertainty about what direction to take her major after graduation, Prof. Yee suggested art conservatorship knowing of her longstanding love of art and art history. So sparked her commitment to a career in art restoration.

Art and chemistry have been linked since the day the first cave dweller smeared mineral pigments on a rock wall. Conservation scientists help conservators understand materials and methods artists used to make works of art and, in some instances, they help determine what is original to the work and what was added in previous restorations. Think of the recent restoration

Ever wonder how the Vatican produces the black and white smoke during the election process of a new pope? For the black smoke (i.e., election deadlock), the mixture is potassium perchlorate, anthracene and sulphur; for the white version that confirms the appointment of the new leader of the Catholic Church, it is potassium chlorate, lactose and a pine resin known as Greek pitch.

of the Sistine Chapel frescos at the Vatican in Rome, which (thanks to chemistry) went from dingy to breathtaking over the course of nearly 20 years.

Mary Cameron will start her art restoration career somewhat more modestly with an internship at the Taubman Museum in Roanoke this coming spring. First, however, in January she'll be traveling abroad for the first time to Peru and Ecuador for a three-week adventure as part of VT's "Wintermester," during which she'll no doubt be using her drawing and burgeoning photography skills to document visits to Machu Pichu and the Amazon.

Mary Cameron is also a dancer (classical ballet, pointe, modern and contemporary), and currently serves as the president of the Ballet Project (VT's only student-run ballet company). Other hobbies include water skiing and drama/public speaking. In fact, she was on the state champion Salem High School forensics team for three years and won two individual titles in humorous duo interpretation.

Once Ms. Brooks receives her degree in May she'll take a gap-year to research graduate or certificate programs in art conservation, coupled with visits to museums where such work is ongoing, such as the Indianapolis Museum of Art. With any luck (but mostly talent, intelligence and determination!), Mary Cameron Brooks might one day have the opportunity to tackle the restoration of a Jackson Pollack, her favorite artist.



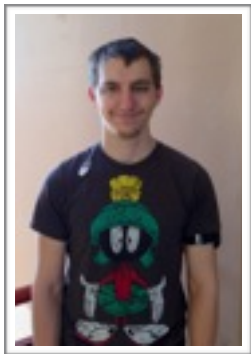
Photo of Mary Cameron Brooks in front of Burruss Hall courtesy of Ashley Montgomery



Brooks' "Pulpless Halves" in ebony, graphite, charcoal, and chalk. "This piece was inspired by The Great Gatsby by F. Scott Fitzgerald (as one can see the novel in the still-life). It is about lost identity and identity confusion."

Brandon Meerscheidt

Having just finished *The Boys in the Boat* by Daniel James Brown (an extraordinary book about the 8-man crew team from the University of Washington who rowed for the U.S. in the 1936 Berlin Olympics), Brandon Meerscheidt's casual mention of his varsity membership on the Virginia Tech club crew team immediately caught my attention—but I'll come back to that.



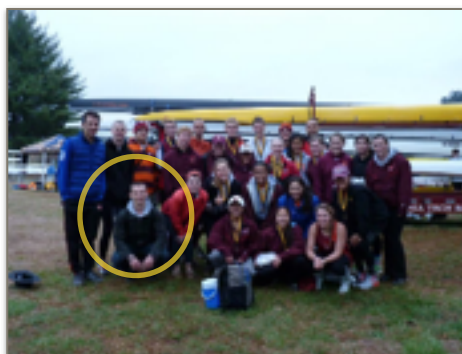
Straight-A chemistry undergraduate Brandon Meerscheidt is a familiar face to most faculty and staff in the department. He's the muscle behind the various office/lab relocations that have taken place with the reopening of Davidson. Brandon works closely with Tom Wertalik (Chem's glassblower and facilities manager) for 10-15-hour per week and never fails to come across as anything but dedicated, capable, and upbeat. As Tom says: "His work ethic is second to none. No job was too difficult, too tedious—too anything! I don't know what we would have done without Brandon—especially with the arduous move out of RB26 [Chem's Corporate Research Center facility during the Davison renovation]. He became invaluable to so many of us during the move and is a truly exceptional young man."

Perhaps his work ethic and facility for engaging so easily with people stems from the fact that he's the son of career Army parents, who by necessity moved the family every few years—from Germany (where Brandon was born) to various destinations in the U.S., and most recently Fredericksburg, where Brandon eventually finished high school intent on a college degree in chemistry. Once he graduates in 2016, Brandon will apply to graduate school—likely pursuing a doctorate in either physical or possibly computational chemistry, but only after he takes Prof. Daniel Crawford's class next year to test those waters. In addition to his paying job, Brandon has also been working in the lab for about a year with Prof. Jatinder Josan—mostly on synthesizing "a weird compound that doesn't seem to want to make itself," which has been a source of some frustration. Nonetheless, when asked about Brandon's contributions, Prof. Josan had this to say: "Brandon has been an invaluable resource to our lab for anything needing sheer brawn (with excellent brains to boot)! What is amazing about Brandon is that not only is he able to do research in my group and work

for the department, but that he is able to scoot through his courses with straight A's. Yet, he still finds time to practice with his team or just hang around in our lab. Great organizational skills, and in my book, a real 'winner!'"

Adding to his "on land" responsibilities is his role as the bow seat rower for Virginia Tech's eight-man crew team—the fastest boat in the sport at up to 14 miles an hour. Brandon rowed in high school and decided to stay on the water with VT Crew—one of the larger club sports at Tech. Crew is not a sport for the dilettante. Races are usually either 2,000 or 5,000 meters, but teams will also be asked to tackle practice distances of 10,000 meters, which can take up to 40 minutes of grueling physical exertion. In fact, physiologists claim that rowing a 5,000-meter race is the equivalent of playing three back-to-back basketball games. During the competitive rowing season, which is September/October for the 5K races, and March/April for the 2Ks, Brandon is up at 4:15 AM *every weekday* so that the team can take advantage of the pre-dawn conditions at Claytor Lake when the water is smoothest. Weekend practices are also common in advance of one of the eight to nine competitive regattas against teams from most of the southeastern colleges and universities. The summer months are used for recreational rowing and training. And throughout the year there is

conditioning, usually on ergometers (stationary rowers) or in the weight room at McComas.



Given all that Brandon Meerscheidt has on his plate with work, undergrad research, and maintaining his stellar academic performance, it wasn't surprising to hear Brandon say that, despite the many hours on and off the water and the intense physical commitment, "crew keeps me sane."



Brandon (right) en route to Claytor Lake

Welcome President Tim Sands!



Prof. Joseph S. Merola, former president of the Faculty Senate, carries VT's Millennium Mace

This fall, two Chemistry faculty played pivotal roles in the inauguration of Dr. Timothy Sands as the 16th President of Virginia Tech. **Prof. Joseph S. Merola** was this year's University Marshall and so led the installation procession carrying the university mace. **Prof. David Kingston**, representing the University Distinguished Professors, had the pleasure of introducing Dr. Sands prior to his installation and placing the VT hood. From Prof. Kingston's remarks: "A Virginia Tech education is designed to equip us to fulfill



University Distinguished Professor David Kingston places the Virginia Tech hood onto President Tim Sands

ourselves and to serve others as we face a variety of challenges. Whether those challenges are personal, professional, or global, the ability to recognize them, analyze them, and ultimately determine a course of action to deal with them, is something that the faculty and staff of this university strive to cultivate—not only in our students, but in ourselves. It's what makes our university enterprise so unique, and so inspiring, to be a part of. Heading such an enterprise requires a special combination of curiosity, energy, and insight, all of which Timothy Sands has displayed throughout his career."

Profs. Long and Moore Led Chemistry's First "Wintermester" class to Germany and France



Profs. Bob Moore and Tim Long organized a winter session course entitled "International Perspectives on the Nanoscience of Macromolecules," which was offered January 2014 in a blended fashion with a winter experience for 20 undergraduates. This experience discussed how cultural traditions have shaped the approach to scientific discovery and entrepreneurship in the United States and Europe. The students discussed and evaluated the controversial issues of science today and gained an understanding of the role of culture, history, and religion on future directions and perceptions of nanoscience. Special attention was devoted to the ethical dilemma that arises in

technological development, the political landscape, the environmental impact of science, and economic policies that shape national research agendas around the world. Itinerary stops included BASF in Germany, Nolas in Switzerland, and The Chemistry and Physics Institute in Paris, France.

In the words of one participant: *My study abroad experience greatly expanded my knowledge on how processes behind nanotechnology research and entrepreneurship interact with regional culture and society. I personally was astonished by how much I learned outside of the classroom over the study abroad trip. Of course we all had lectures about polymers and how they relate to nanotechnology, but most of my learnings came from reflections resulting from the excursions we took outside of the classroom.*

Profs. Long and Moore and their students in Mainz, Germany



Davidson Hall Rededication:

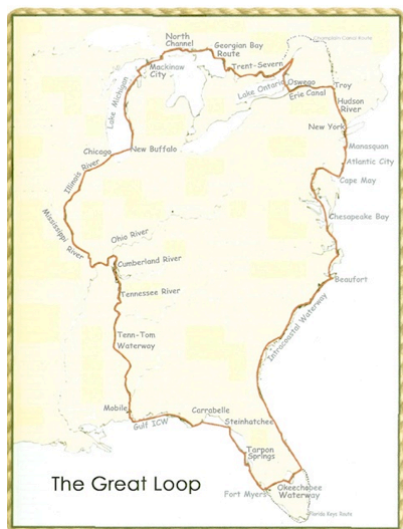
The Department of Chemistry Advisory Council (DCAC) is planning a "rededication" and alumni reunion ceremony to coincide with the completion of the renovation of Davidson Hall. We are conducting a survey to assess interest in this event and to get suggestions about possible activities. To participate, please go to:

<http://goo.gl/XbXrdx>

Chemistry Alum Completes the Great Loop Cruise

Alumni Profile: Robert E. Schwerzel, Ph.D. (B.S. Chem., 1965)

Sometimes, it takes a while to turn a dream into reality. About ten years ago, my wife Janet picked up a copy of *Honey, Let's Get a Boat* by Ron and Eva Stob. The book described that couple's



adventures in doing the Great Loop cruise in their own boat, and the dream of someday doing that cruise ourselves began to form. The Great Loop is a cruise around the eastern third of the United States, mostly on intracoastal

waterways, some of the Great Lakes, and the inland rivers from Chicago to Mobile. The Loop consists of about 6,000 miles of interconnected rivers, lakes, bays, and canals, depending on the specific path taken, and typically takes about a year to complete. It is usually done in counter-clockwise fashion so as to take advantage of the natural southerly current of the inland rivers. "Loopers" by necessity follow the seasons as well: East Coast in spring, northern portions in summer, inland rivers in fall, and Florida in the winter. A wealth of information and support for those wishing to learn more about doing the Loop cruise is available from AGLCA, America's Great Loop Cruisers' Association (www.greatloop.org).

It took us several years of preparation and learning how to cope with the differences between lake boating and extended cruising, but finally the stars all aligned and at the end of March, 2013, Janet and I both retired and "cut the lines" to begin our Loop from Beaufort, SC. Our route mostly followed the path shown on the map, with the exception that we took the northerly extension through Montreal and Ottawa. Although we anchored a few times along the way, we stayed at marinas most nights. At each marina, we would

look for the white AGLCA burgees that identified other Loopers who might be staying there. There was an immediate camaraderie between Loopers because of our shared goals and experiences, and more often than not we'd get together for "docktails" at the marina and then perhaps go into town together to explore the prospects for dinner. We frequently saw the same boats at various stops along the way, and we made some great friends through these encounters.



Bob and Janet on the bow of the Harmony

A typical cruising day would start around 6:30 a.m. or so. Janet would get a pot of coffee going while I did a quick check of the engine room and started the engines. I'd bring in the shore power cable and the water hose, Janet would bring in the dock lines to free us from the dock, and we'd be off. I drove the boat most of the time and Janet sat with me at the helm, checking our route with the charting software on our GPS-enabled iPad while I referred to the dedicated chartplotter and radar mounted at the helm. This approach provided redundancy in our navigation and was often very helpful to us, as the different charting programs sometimes showed different details for the same region. Every couple of hours, Janet would take over the helm and drive for a while to give me a break, and we usually took turns driving at breakfast and lunch so we could each enjoy our meal without having to focus on where the boat was going. While driving the boat is not physically difficult, it requires a good deal of extended

concentration, as the waterways are strewn with shoals and other hazards that may or may not be shown on the charts. It was comforting to know that we were always within reach of help if needed, by VHF radio or cell phone.

We finally “crossed our wake” back in Beaufort, SC on July 1st, 2014, some 15 months, 147 locks, and nearly 6,000 miles after we’d started. It was with considerable pride that we replaced our White Burgee with the Gold Burgee that symbolized our completion of

the Loop. That evening, we celebrated with a bottle of champagne and reflected on the fact that our journey had taken us through parts of 15 states and 2 provinces in Canada. It was an incredible adventure that let us see our country in a completely new way, brought us a number of wonderful new friends, and gave us newfound closeness and confidence in each other. We don’t know where our next adventures will take us, but we’re pretty sure they’ll involve our boat, one way or another!



The Big Chute Railway Lock (Trent-Severn Canal)



Other Chemistry Alumni News

Prof. Paul Chirik (B.S. Chem, 1995) has become editor-in-chief of the ACS journal *Organometallics*. After leaving Virginia Tech, he went on to the California Institute of Technology for his Ph.D., and then joined MIT as a postdoctoral fellow. Following 10 years as a faculty member at Cornell University, in 2011 he moved to his current institution, Princeton University, where he now serves as the

Edward S. Sanford Professor of Chemistry. Prof. Chirik and his research group are currently tackling longstanding problems in chemical synthesis—for example, developing catalysts using



earth-abundant elements that focus on more environmentally-benign syntheses.

Dr. Christopher Wohl (B.S. 2002) has won the 2014 Adhesion Society Distinguished Paper Award for

the paper “Novel Epoxy Particulate Composites for Mitigation of Insect Residue Adhesion on Future Aircraft Surfaces” presented at the 2014 Annual Meeting of the Adhesion Society. Christopher Wohl works at the NASA Langley Research Center. In this paper, the authors presented their research findings regarding the generation and evaluation of epoxy particulate composite coatings for mitigation of insect residue adhesion. These coatings were developed in support of the Environmentally Responsible Aviation project towards maintenance of laminar flow on future aircraft wing surfaces.

Dr. Ende Pan (Ph.D., 2010, with Prof. Kingston) did his postdoc training in the Department of Biochemistry at UT Southwestern Medical Center at Dallas and was awarded Chilton Fellowship in 2013, which honors the “most promising” postdoctoral fellow. Ende moved to MA in the early of 2014 and has been working as a scientist at Warp Drive Bio, LLC, in Cambridge, MA.



Dr. Jim Hedrick (B.S., Chemistry, 1981; Ph.D. Materials Science and Engineering, 1985, advisor Jim McGrath) was elected to the National Academy of Engineering. Dr. Hedrick's recent research targets the creation of substances with Marvel Comics-worthy descriptors. There's the self-healing, "Wolverine-like" substance that arose from a recycled water bottle and something called "ninja particles" that will advance the reality of nanomedicine. Both discoveries will inevitably make their way into consumer products in the near future. Congratulations, Jim!

Dr. Joe LeFevre (Ph.D. with Prof. D. Kingston, 1984) recently earned top honors in a international photo contest called "Wilderness Forever," sponsored by Nature's Best Photography, The Smithsonian, and the Wilderness50 Coalition. There were over 5,500 entries in four categories. Joe won in the "Most Inspirational Moment" category in the professional division. The image below, which was taken at Olympic Wilderness in Washington, won The Peoples' Choice Award for September. It is currently on display at the Smithsonian's National Museum of Natural History in Washington D.C.

Joe is currently a full professor of organic chemistry at the State University of New York (SUNY) at Oswego, but also serves as a staff instructor at the Adirondack Photography Institute (www.adkpi.org), where he give photo tours and workshops throughout the Adirondacks of Upstate NY, and at other select locations. He and his wife, Linda (also a Hokie in electrical engineering), have three grown children.



Photo courtesy of Joe LeFevre
(cannot be reproduced without Dr. LeFevre's permission)

Brian Murphy (Ph.D. with Prof. Kingston, 2007), now a professor in the Department of Medicinal Chemistry & Pharmacognosy at the University of Illinois Chicago, has been investigating marine and freshwater microorganisms as a vastly unexplored source for molecular probes and drug leads. The Murphy lab at UIC (www.uic.edu/~btmurphy) focuses on the discovery and development of novel pharmaceuticals from aquatic actinomycete bacteria. His work as an "Antibiotic Hunter" (most recently in the waters off of Iceland and Vietnam) was recently featured in an online article:

<http://projects.thestar.com/antibiotics-resistance-and-the-race-for-new-bacteria/#one>



Photo courtesy of Erlendur Bogason



Dr. Murphy's aquatic lab

Department of Chemistry Advisory Council

The Department of Chemistry Advisory Council (DCAC) is a volunteer organization of alumni and friends of the department who provide their collective perspectives, ideas and financial support to advance the VT Chemistry Department objectives. Currently the DCAC has 37 members; about 1/3 of the members meet twice a year in the Spring and the Fall. These meetings provide an opportunity for the DCAC members to learn about the current research being done by the Department faculty and their collaborators, and to learn



DCAC Chair, Tom Piccariello

about future research endeavors. The meetings also enable DCAC members to interact with faculty, staff and students, as well as discuss with the Department Chair and Executive Committee identified areas of concern. During the Spring and Fall 2014 meetings, the DCAC identified several key initiatives/actions to focus their activities in the 2015-2017 calendar years. The initiatives/actions will help achieve the strategic objectives of the DCAC (see list on the following page).

On October 24/25, DCAC members Frank Akers, Beth Calvey, Chris Curfman, Erick Iezzi, Ann Norris,

Mike Ogliaruso, Tom Piccariello, Vince Remcho, Michael Smith, Bill Starnes and Sharlene Williams met to further advance the DCAC strategic objectives. The members initiated a fact-finding mission to gain an understanding of the different perspectives on budgeting and hiring priorities from the College of Science. Pursuant to that DCAC members met with the Executive Committee, the Dean of COS, the Vice Provost and other COS Department Heads and Chairs. In addition, DCAC met with ACS representative Valerie Kuck to learn more about the ACS program called "Preparing for Life after Graduate School" (PFLAGs) as it relates to the student mentoring initiative. Other items of business

included sending out e-mails to alumni to enlist more members in the DCAC and/or foster greater advocacy for the Department, investigate key criteria for student recruiting and reformulate strategy to long term support for the Department's endowed funds that support graduate student recruiting and a key fund not yet endowed – The James P. Wightman Lecture Series Excellence Fund – that is intended to bring outstanding speakers to campus benefiting students, faculty, and the university community.



DCAC Vice-chair, Ann Norris



Two of DCAC's newest members: Erick Iezzi and Sharlene Williams

Key DCAC Objectives and Actions for the 2015-2017 calendar years

Objective 1: Support the exchange of information/ knowledge on current and pertinent research areas related to all areas of chemistry and related disciplines

Key Actions:

- 1.1 – Work with the Department leadership and College of Science Development office to establish an Industry Affiliate Program, to provide industrial members with academic and recruitment benefits – including an appropriate approach to integrate the program with those in existing Institutes/Program (e.g., ICTAS) on campus.
- 1.2 – Develop a strategy to ensure that the James P. Wightman Lecture Series Excellence Fund is fully endowed to enable the department to increase its ability to bring outstanding speakers to campus.

Objective 2: Enhance the technical skills and knowledge of undergraduate and graduate students and post-doctoral associates through student mentoring and advocacy

Key Actions:

- 2.1 – Continue DCAC participation in the Spring Undergraduate Student Poster as judges
- 2.2 – Work with the ACS student affiliate chapter and the Department undergraduate advisors to formulate a plan on how best to provide student mentoring

Objective 3: Increase Departmental outreach to and interaction with Alumni

Key Actions:

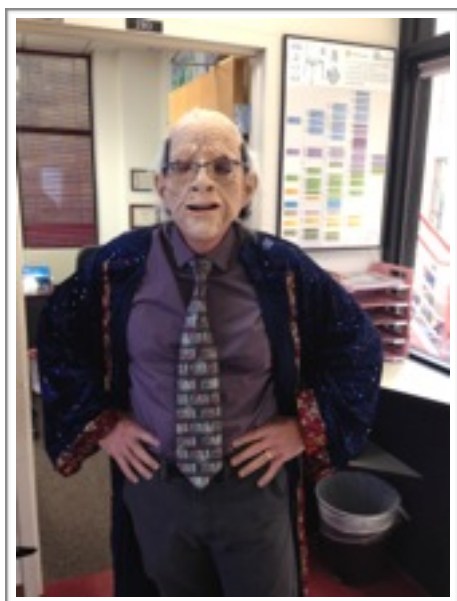
- 3.1 – Help the Department to establish appropriate social media functions to communicate with Department Alumni
- 3.2 – Work with the Department to develop a Davidson Hall rededication Ceremony upon completion of Phase 2 of the Davidson Hall renovation.

Objective 4: Assist the Department in accomplishing their strategic goals where appropriate

Key Actions:

- 4.1 – Work with the Department to establish appropriate social media functions to enhance the recruiting effort of the Department for prospective students and potential faculty
- 4.2 – Continue to serve as a liaison between students and faculty/administration.
- 4.3 – Continue to advocate for Department resources at the College and University level

And just for fun....

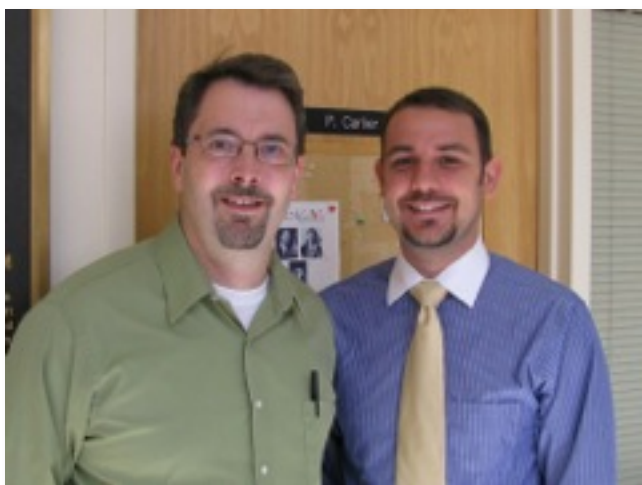


Professor Tim Long en route to teach his organic chemistry class on October 30th



From Malaria Research to Medicinal Marijuana

Alumni Profile: Dr. Joshua Hartsel (Ph.D., 2011)



Dr. Joshua Hartsel (right, above) has had quite an interesting career since earning his Ph.D. with Prof. Paul Carlier (left), with whom he designed safe insecticide targets to combat the African malaria mosquito. In fact, they devised a successful hit-to-lead optimization strategy that culminated in identifying six novel ligands with an unprecedented level of enzyme selectivity (>500-fold). Several VT chemistry publications and a patent resulted from this work. Notably, collaborators in Africa, and important multidisciplinary faculty at Virginia Tech contributed to the success of this project (i.e., Prof. Jeff Bloomquist in Entomology) and Prof. Jianyong Li in Molecular Biology). Joshua recalls, "My time at Virginia Tech was extremely rewarding. I was able to work on stimulating projects that had significant translational significance for malaria stricken regions of sub-Saharan Africa."

Dr. Hartsel continued his academic career with a 3-year postdoctoral fellowship, making a transition from VT Chemistry to the Public Health Department at The University of California, Irvine. Under the guidance of Dr. Guiyun Yan, Joshua traveled abroad to evaluate methods to mitigate insecticide resistance mechanisms, and to evaluate environmentally safe and people-friendly insecticide formulations in China. He was fortunate as a Ph.D. and postgraduate scholar to work on projects funded from the National Institutes of Health and The Bill and Melinda Gates Foundation.

After wrapping up academics he entered a new career in the rapidly emerging cannabis industry. Dr. Hartsel stated that, "Over the past decade there has been a lot of literature supporting the therapeutic

value of cannabis. There was undeniable shift occurring in public support and I wanted to be a part of this historic event." Over the course of a few years Dr. Hartsel served as a board member on the Association of California Cannabis Laboratories, founded a cannabis chemistry company (Delta-9 Technologies), and now serves as the Director of Research and Development at CannaVest Corporation. His work has been published in several peer-reviewed scientific journals, covered on major news networks (CNN and ABC 10 San Diego News), and earned recognition in multiple 'High Times' Cannabis Cups (2013 Amsterdam, 2013 Seattle, 2014 Los Angeles, 2014 Michigan, and 2014 Seattle)/Michigan "Green Cup" for the highest cannabidiol (CBD) concentrates.



When asked what he considered to be the future of the cannabis industry, Josh had this to say: "Our society is moving towards the decriminalization of cannabis and as that happens, it will be hard for any one company to control botanical compounds that are in the public domain. However, there will always be a need for cannabinergic drugs specifically engineered to treat specific medical indications. Various companies are developing the methods necessary to further our understanding of cannabis science. In my view, professional companies like GW Pharmaceuticals have been very positive for our industry. They are currently working with U.S. regulatory agencies to gain approval in recognizing cannabis as a medicine. They have also demonstrated that many of the compounds found in cannabis do have therapeutic value."

Perhaps most important, they have been able to do this using clinical studies and hard facts as opposed to anecdotal evidence that is so common in the cannabis industry. Further, many companies are working on plant genetics and molecular biology to increase the yield of the desired cannabis components. Since it has been illegal for decades, there is a tremendous amount of basic research that can be applied to *Cannabis sativa*.

It is hard to say what the future holds, but the cannabis industry will certainly face more strict manufacturing and quality control regulations. Whereas no respectable scientist or professional businessperson would have risked his or her career in this sector a decade ago, now you see professionals from all industries flocking to this burgeoning sector. Also important to note that, as opposed to the prescription-based medical use of cannabis where precise cannabinoid formulations will be used to target specific therapies, it will likely be regulated like alcohol and tobacco for recreational purposes. Like all plant-based medicines, new compounds will eventually be synthesized and approved by the FDA as treatments for a variety of conditions. As the industry grows I hope both the traditional and pharmaceutical cannabis segments of our industry each can have their place and perhaps complement one another."

"Now that we are producing unparalleled CBD formulas derived from industrial hemp, as opposed to marijuana, my personal mission is to identify the precise mechanisms of action for cannabidiol (CBD), and how that translates into noted health benefits. Oversimplification has dominated the commercial marketing of these products, and I am committed to elucidating the pluripotent effects of these remarkable plant compounds."

A recent article about "the science of CBDs" can be accessed at this link: <http://www.hightimes.com/read/harry%E2%80%99s-world-science-cbds>



Dr. Hartsel in Kentucky in the first legally grown hemp field in the U.S.

In Memoriam

Dr. Ian "Jake" Chapple

(PhD 1984, advisor Ray Dessy) lost his long battle with cancer on Dec 28, 2013. He is survived by his wife of 30 years, Catherine Schenck (PhD, 1981, John Dillard). Jake was a proud Hokie and kept in touch with many of his fellow grad students, many of whom joined in a celebration of his life early this year. Despite 35+ years in the US, he remained an Aussie citizen to the end — always enjoyed a good beer and traveling the world, including finishing his bucket list of visiting all 50 states. A special shout out to fellow Dessy alums Mark Wingerd, Steve Conder and Steve Choquette for all their support. Cheers, Mate!



Prof. Marie Elizabeth Krafft, (a triple Hokie, PhD, 1983) passed away on November 9, 2014 after a two year struggle with brain cancer. She was the Schwartz Professor of Chemistry and Biochemistry at Florida State University. According to her moving obituary (<http://www.bevisfh.com/obituaries/Marie-Krafft/#!/Obituary>), "She made a difference in the world."



Giving Back: Your support allows us to continue to “Invent the Future”

It is an exciting time for the Department of Chemistry at Virginia Tech! Our world-class faculty are pursuing research that addresses the complex needs of today's society, while simultaneously training the next generation of science leaders. Your support is critical to our success.

Every institution of higher learning is faced with increasing costs and diminished state funding. VT Chemistry benefits from donations from its alumni, corporate sponsors, and friends in helping to bridge the funding gap. Unrestricted contributions to the department's general fund have an immediate impact on day-to-day operations. Working with its advisory council, the department has also established several endowed funds to address specific needs over the long term. Depending on their priorities and interests, donors may designate their gifts to one or more of these funds knowing that their gifts will go directly to that area of departmental need.

Donations to both the general fund and the endowed funds are needed and appreciated, helping the department in the short and long term. Contributions to the general fund are a primary source of discretionary funds at this time. Contributions to an endowed fund provide a steady, sustained stream of funding for the purpose supported by their fund. The table below summarizes the individual funds.

When you receive your College of Science Annual Fund letter or phone call, please earmark your support for the Department of Chemistry to the general fund and/or one or more of these special funds. Simply make

a notation on the gift card or let the caller know that you want to direct your donation to the Department of Chemistry, and then include the specific fund name and number.

To make an immediate contribution by mail, print out and complete the following form available online at: <http://www.givingto.vt.edu/PDF/gift-pledge-form.pdf>

When completing the form, please click the button marked “Applied to a college, department or area designated below,” and then enter the name and number of the desired fund from above on the line(s) provided. Finally, mail the completed form and your pledge to:

University Development (0336)
University Gateway Center, Virginia Tech
902 Prices Fork Road
Blacksburg, VA 24061

Alternatively, you can donate online via the following link: <https://webapps.es.vt.edu/givingto/academic/gift>
When donating online you must first click the blue button marked “Enter Your Own,” then type in the number and name of the fund to which you plan to donate.

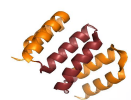
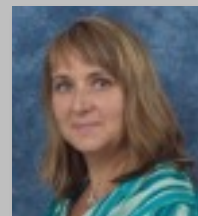
For more information about these funds or to learn more about other ways to give, please contact Jenny Orzolek, Director of Development for the College of Science, at (540) 231-5643 or jorzolek@vt.edu.

We thank you for your support!

Name of Fund	Impact	ID Number
Chemistry General Fund	Provides immediate discretionary funding for a range of activities including graduate and undergraduate recruiting and scholarships, commencement, faculty, staff, and student activities and awards, faculty recruiting, seminar program, alumni newsletter, and more.	881327
The Friends of Larry Taylor Excellence Fund	This endowed fund provides long-term support for a range of departmental activities including lectureships, scholarships, and more.	886047
Harold M. McNair Alumni Endowed Fund	Supports graduate education and recruiting in the Department of Chemistry by augmenting stipends for graduate students to make them more competitive, funding visits of prospective students to campus, providing travel funds for professional meetings, and more.	885802
James P. Wightman Lecture Series Excellence Fund	Brings outstanding speakers to campus, benefitting students, faculty, and the university community.	860634
Chemistry Friends Scholarship	Undergraduate scholarships awarded according to potential and need.	885487
Dallas Kinser and R.T. Johnson Scholarship		885628

Prof. Tijana Grove and her research group focus on the design and synthesis of proteins and peptides for a broad variety of applications, such as the assembly of nanostructured materials with tunable morphology and function, biosensing and drug delivery. Current projects include:

- Design of synthetic capture modules for point-of-care diagnostics.
- Design of theranostic nanoparticles.
- Bio-enabled synthesis of metallic nanoparticles and nanoclusters for optical sensors and catalysis.
- Synthesis, assembly, and characterization of protein-polymer conjugates and composites with selected functionality, composition, and molecular architecture.



The Grove Group



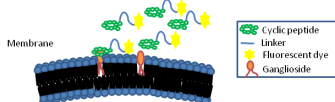
Techniques & Instrumentation

- Peptide synthesis
- Recombinant protein expression
- Chromatography
- Spectroscopy
- Materials Characterization: SEM, TEM, DMA, nanoindentation

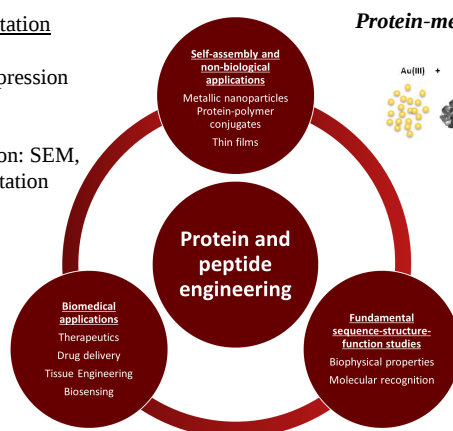
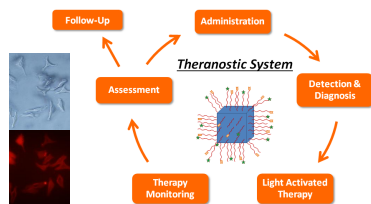
Research at the Interface of:

- Chemical biology
- Bionanotechnology
- Biomaterials

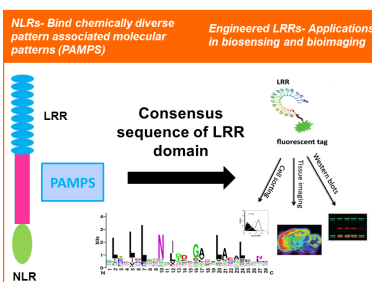
Synthetic lectins: Cyclic peptides for targeting gangliosides



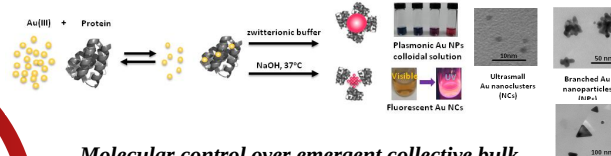
Stimuli responsive MOF nanoparticles for targeted delivery and imaging



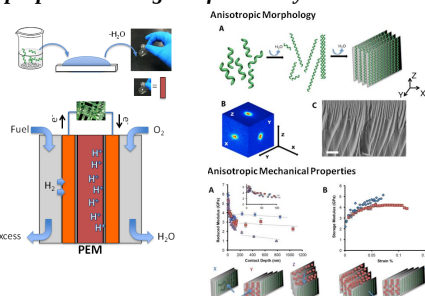
Capture modules for point-of-care diagnostics: targeting bacterial peptidoglycans and nucleic acids



Protein-mediated synthesis of metallic nanoclusters and nanoparticles



Molecular control over emergent collective bulk properties through self-assembly



Synthesis and self-assembly of protein-polymer conjugates

