

The Cavendish Chronicle

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Justin Sachs in the Ecuadorian rainforest. More summer experiences, p. 4.

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Cavendish Archive

<http://employees.csbsju.edu/cschaller/Cavendish.htm>

Discovery As A Way Of Life

When **Michael Gross '62** arrived at St. John's from the small town of Preston, MN, he discovered a new world of music, art, movies and especially science. Now a Professor of Chemistry at Washington University in St. Louis, he continues to cross new frontiers in chemistry as the head of his own highly successful research lab.

A professor at a major research institution such as Washington University has a very different job than a professor at a liberal arts college like CSB/SJU. Although he occasionally teaches undergraduates, Gross is more likely to teach a graduate course. However, the majority of his responsibilities do not involve teaching at all, at least in the familiar sense. Instead, he is charged with the creation of new knowledge and the production of highly trained scientists, both of which have been considered to be strategic priorities for the United States since World War II.

SJU Alum Michael Gross' Career Mixes Basic Science and Potentially Life-Saving Applications

On a daily basis, Gross designs research and directs a research group that currently includes 16 persons (9 PhD students, 3 postdoctoral students, and 5 support staff). Much of his time is spent discussing and interpreting data, publishing papers and writing grant proposals to fund his research. He also serves on a number of advisory boards and is the Editor-in-Chief of a major scientific publication, *Journal of the American Society for Mass Spectrometry*, and a coeditor of the *Encyclopedia of Mass Spectrometry*.

It's a very demanding job, but there are rewards. About once per month, Gross has the opportunity to lecture at conferences or



Gross at a Gordon Conference in New Hampshire

other universities. In mid-September, he spent a week in Siena, Italy, lecturing at the 1st International Mass Spectrometry School, a short course designed for Ph.D. students, postdocs and industrial scientists. He made sure to budget some time on the trip so that he and his wife could enjoy some sightseeing, pasta, and Chianti as well. He also looks forward to lecturing soon at the 3rd International Conference on Protein (*continued, page 7*)

Professor Visits From SWU, China



Professor Huang Mei.

*Investigating
cross-cultural
differences in
chemical
education*

Professor Huang Mei, Ph.D, Associate Professor and Deputy Director of Science Research for Chemistry Teacher Education, School of Chemistry and Chemical Engineering, Southwest University, Chongqing, People's Republic of China (PRC) arrived at CSB/SJU in August to begin a year stay as a visiting Professor of Chemistry.

Professor Huang earned a B.S. in Chemistry at Xi-hua Normal University, an M.S. in Chemical Curriculum and Instruction at Sichuan Normal University and a Ph.D. in Curriculum and Instruction, Southwest University and East China University. She teaches a variety

of courses at Southwest University including Pedagogy, Psychology, Curriculum and Instruction, Research of Chemical Experiments, and Foundational Chemistry and Biochemistry. In 2010 she was Senior Visiting Scholar in Brain Science and Learning at the National Key Laboratory of Cognitive Neuroscience and Learning at Beijing Normal University.

Dr Huang was awarded funds for her year as a Visiting Professor through the China Scholarship Council which is affiliated with the Ministry of Education of the PRC. Her main project is to conduct a comparative study on instructional strategies of

chemistry teachers in the US and China. Professor Huang plans to study the similarities and differences of cognitive learning styles and cultural backgrounds between Chinese and American students. Her studies will include a comparison of collaborative learning in classrooms, of homework and teaching examples, and of cognitive learning modes. Professor Huang will attend first year classes and labs at CSB, learn about the research-supported pedagogy that we have adopted, and work with high school teachers at both Saint John's Preparatory school and Apollo High School.



Schaller

Chem Professor Delivers Address

Dr. Chris Schaller delivered the address from the faculty at the CSB 2013 Fall Convocation. This event marked the second year in a row that the address was delivered by a member of the chemistry department. **Dr. Ed McIntee of chemistry** spoke at

the Fall 2012 CSB convocation.

Last year, McIntee spoke about the importance of collaboration in both learning and the workplace.

This year's faculty address looked at the balance of academics, service and re-

flection expected of students at CSB/SJU. Schaller's remarks drew from quotes by Neil DeGrasse Tyson, the noted astrophysicist, as well as **Abbot John Klassen** of St. John's. Klassen is a former CSB/SJU chemistry professor as well as an alumnus.

Adjunct Instructors Pitch In for Chemistry

The chemistry department welcomes new adjunct faculty members to CSB/SJU this fall.

Dr. Rachel Hutcheson and **John Hoody** join **Dr. George Anquandah**, who has been an Adjunct Assistant Professor here since last year. Anquandah is from the busy seaport city of Sekondi, Ghana, home to gold, cocoa, timber and crude oil industries. He earned a B.Sc. from Kwame Nkrumah University of Science and Technology in Ghana and M.Sc. from Braunschweig Technical University in Germany. He has a Ph.D. in analytical chemistry from Florida Institute of Technology and also did post-doctoral work there. He is a

fan of soccer, of course, as well as gospel music.

Hoody, a Bemidji native, earned a B.A. in biology with a minor in chemistry from the University of St. Thomas. For his graduate work at University of Montana he prepared an extensive library of synthetic analogues of a natural product in order to optimize antibiotic effectiveness. He has considerable industrial experience, having worked as an analytical and food chemist at General Mills, 3M and Upsher Smith. He enjoys fishing, hockey, golf and “attempting to fix cars and trucks.”

Hutcheson grew up on a farm and ranch in central

Montana. She received a B.S. in biochemistry from Seattle University. Following an REU experience at Montana State University, she decided to pursue a Ph.D. in bioinorganic chemistry there. She worked in the lab of Dr. Joan Broderick with a focus on FeS cluster containing enzymes. Outside of work, she enjoys time with family and friends, being outdoors, and reading.

Adjunct faculty fill a short-term need for additional instructors; typically, adjuncts in the department have used the position as a springboard to a permanent teaching job at another college.



Anquandah



Hutcheson



Hoody

RIOUX RETURNS

Emeritus Professor Frank Rioux has returned to the department to teach Chem 318 this fall. Rioux previously taught general chemistry and quantum mechanics for over 40 years at CSB/SJU. He first joined the institution shortly after earning a Ph.D. from Iowa State University, where he worked in inorganic spectroscopy. An avid runner, Rioux has completed over 20 marathons, but has adopted a more leisurely pace in his retirement.



Glasgow, Kopp Make Movies

Meghan Glasgow '16 and **Asha Kopp '16** have produced a series of introductory videos for students in Purification I & II Laboratories. The short segments lead students through basic skills and also explain the ideas behind some of the techniques in the laboratory.

“I was quite impressed,” said **Dr. Brian Johnson** of the chemistry department. “The camera work was clear, the narration good, and the videos



Meghan Glasgow (l) and Asha Kopp

were concise but illuminating.”

Glasgow and Kopp worked interactively with a number of chemistry professors to develop the videos. The duo aims to produce material for Synthesis Lab in the upcoming year.

My Summer

Vacation

CSB/SJU chemistry and biochemistry students reported a variety of activities over the summer of 2013.

Several students were engaged in mentoring children. **Erin Wissler '14** worked as a Camp Counselor for the Jordan YMCA in Indianapolis, Indiana. **Josh Lorenz '15** was a counselor at Camp Sweeney, for children with diabetes, in Gainesville, TX. He helped test blood sugar levels, determine insulin dosages, administer insulin, and treat other medical needs, plus taught fun summer camp classes. **Victoria Green '16** was the kindergarten and 1st grade program specialist at Boys & Girls Club in Council Bluffs, Iowa. **Leslie Ramirez '16** taught 8th grade chemistry with Breakthrough Saint Paul.

Some students participated in activities geared towards their pre-health career goals. **Kaitlyn Lauer '14** interned at Children's Dental Services in Minneapolis through the Jackson Fellows program. **Ryan McMillan '14** worked for the Emergency Physicians Professional Association as a medical scribe in

In addition to regular summer jobs, positions related to chemistry, medicine, service



Erin Wissler at the climbing wall



Students working in Ardolf Science Center this summer

the emergency room at Mercy Hospital and Unity Hospital. **Mai Chee Vang '15** participated in the University of Minnesota's summer pre-dental school program. **Amy Knutson '15** volunteered at a local hospital and also worked as a bank teller.

A number of students worked on research projects in Ardolf Science Center over the summer. **David Crotteau '14** and **Michael Humbert '14** worked with **Dr. M. A. Fazal** on applying nanoparticles to cost-effective, bioanalytical devices, with a focus on

the detection of cellular metabolites linked to disease. **Paige Armbrister '14** and **Brianne Gibson '15** worked with **Dr. Nicholas Jones** and **Dr. Kate Graham** on the epoxidation of allylic hydroxy phosphonates and the cyclization of propargyloxy acetyl chlorides. These compounds are important intermediates in the potential syntheses of a number of natural products. **Graci Gorman '14** and **Anna Luke '15** monitored the kinetics of dehalogenation of aromatic molecules in aqueous conditions under **Dr.**

Regular Summer Jobs, Plus Positions in Chemistry, Health, Service

Alicia Peterson this summer. The project has ramifications for environmental remediation efforts. **Harry Gerdes '14**, **Sam Klinker '15** and **Erica Sinner '15** worked with **Dr. Ed McIntee** working to synthesize inhibitors for Low Molecular Weight Protein Tyrosine Phosphatase. **Ellen Black '15** and **Clare Johnston '15** worked with **Dr. Chris Schaller** developing polyurethane components from renewable resources. **Brian Bohman '15** and **Haley Chatelaine '16** developed ligands for modeling blue copper proteins under the guidance of **Dr. Brian Johnson**.

Other students also worked in Ardolf. **Bailey Drewes '15** and **Tom Steichen '15** worked in the chemistry stockroom. **Asha Kopp '16** and **Meghan Glasgow '16** were involved in laboratory development projects in preparation for the fall semester.

Some students' summer research took them to another part of the country. **Autumn Flynn '14** and **Carla Saunders '14** did research at Montana State University in Bozeman with Dr. Nicholas Jones in collaboration with MSU's Dr. Mary Cloninger.

They did research on a dendrimer-based cascade catalysis. The project involved six weeks in Montana doing synthetic work followed by a month back at CSB/SJU for catalyst testing. **Joe Wick '14** worked on a project characterizing the carotenoid cleaving enzymes in Dr. Johannes von Lintig's lab at Case Western Reserve University. **Mel Quintanilla '15** did research at Loyola University in Chicago. Her goal was to develop photodynamic therapy agents to target folate receptors, hopefully allowing for selective initiation of cancer cell death. **Lorien Rusch '16** participated in the "Hooked on Photonics" NSF-REU program at University of Washington. She synthesized quantum dots: electro-optical devices based on zinc and cadmium chalcogenide nanocrystals. **Emmanuel DeLeon '16** also worked in the area of materials / electronics. He made conducting polymers at Texas State University.

Some students traveled further afield. **Justin Sachs '15** went to the Ecuadorian rain forest and the Galapagos islands for a short term study abroad class, "Evolution, Ecol-

ogy, and Biodiversity" (see picture, front page). **Jamia Moss '15** went on the summer study abroad program in Japan, studying Japanese society pre- and post- tsunami.

Others participated in the Summer Research Exchange Program with Southwest University in Beibei, China. The program was pioneered by **Dr. Henry Jakubowski** of CSB/SJU chemistry. **Hasini Kalpage '14** and **Naomi Do '15** worked in Beibei on the isolation and characterization of novel mycobacteriophages. Kalpage was also able to return home to Sri Lanka for a brief visit.

(continued page 10)



(L-r) Hasini Kalpage, Syn Ching Lim and Naomi Do visit the Forbidden City.



Better Medicine Through Chemistry



Dr. Aaron Mohs

*Inspired at
Saint John's
to explore a
world of
chemistry*

Aaron M. Mohs '02 must miss the time when a ten minute Link ride separated his dorm room from his chem classes. These days he has an appointment in a joint academic department that has members in both Blacksburg, VA and Wake Forest, NC – a mere four hour drive apart.

Mohs received his Ph.D. in Pharmaceutics and Pharmaceutical Chemistry from the University of Utah in 2006, following his undergraduate degree in chemistry from CSB/SJU. From 2006 to 2011, he held a Center of Cancer Nanotechnology Excellence Distinguished Fellowship at Emory University in Atlanta. He is currently an Assistant Professor in the Wake Forest – Virginia Tech School of Biomedical Engineering and Sciences.

Research in the Mohs lab, on the Wake Forest campus, is centered on the use of nanoparticles in medical imaging. Nanoparticles, such as semiconductor quantum dots (QDs), have enormous potential for biomedical imaging. One reason is that the fluorescence emission of quantum dots is easily tuned by control-

ling the size of the particles. In addition, nanoparticles are very robust and resist photobleaching, which can degrade other compounds.

Mohs' major job responsibility is directing the activities of his own research group, as well as being a collaborator with other research laboratories at Wake Forest and Virginia Tech. He does teach classes, primarily in drug delivery and contrast agent design. A third facet of his job involves being available for service activities, both for Wake Forest University and for outside organizations.

A typical day for a young assistant professor at a research institution is filled with meetings, although Mohs certainly enjoys many of them. Very frequently, he goes through data analysis with his lab personnel, keeping up on their latest results and helping them to problem-solve. He also discusses their project directions and career development. At this time, his lab includes one post-doc, two graduate students and two undergraduates. In addition, he co-supervises several graduate students in other labs as part of

ongoing collaborations. A significant portion of his time is also devoted to writing, whether to prepare manuscripts for publication or to develop grant proposals.

Mohs' job also involves travel. He attends 3-5 conferences per year, including annual meetings of the Biomedical Engineering Society and the Tissue Engineering and Regenerative Medicine International Society. He also goes to several smaller meetings that focus on nanotechnology for therapy and imaging.

Some of the service duties Mohs has become involved with help to facilitate others' research. He serves on an external grant review panel for two different state level funding agencies. Previously, he has served as a chair for a working group at the National Cancer Institute on the characterization of nanomaterials / nanoformulations. He also serves on several committees within his own department at Wake Forest.

Given the highly interdisciplinary nature of his work, it isn't surprising that Mohs has a number of *(continued page 12)*

Gross Chalks Up Over 40 Years of Independent Exploration

(from page 1) Biophysics in “one of the charming colonial towns in the mountains of central Mexico”.

Over the course of his career, Gross has made a number of high-impact advances in the field of mass spectrometry. Work in his lab has included very practical tasks such as building new mass spectrometers and developing new analytical methods. His students have also performed very esoteric demonstrations of the abilities of these techniques, such as capturing gas atoms inside buckminsterfullerenes or buckyballs, which are spherical, cage-like molecules composed of carbon.

The time spent honing those techniques allows new approaches to problems that seemed elusive just a decade ago. Gross thinks work in his lab now may be more exciting than ever. His team is developing ways “to footprint proteins to learn how they interact with ligands, how they fold and unfold, and how they interact with each other, all with implications in human health and photosynthesis,” he explained. “These new research strategies fill a void between high resolution X-ray crystallography and NMR and low resolutions methods like fluorescence and circular dichroism. My hope is these strategies will allow us to characterize proteins in a higher resolu-

tion approach than possible now under conditions that are biologically relevant and not amenable to X-ray and NMR.”

One recent project in the lab focused on the nature of Abeta, the small protein that makes plaques in the brains of Alzheimer’s patients. Gross sought to determine how this protein interacts with itself to make a plaque and how it interacts with other factors in the human brain. “This is nearly impossible to do by standard methods,” said Gross. Some of their latest findings on this project were recently accepted for publication in *Proceedings of the National Academy of Sciences of the USA*.

What Gross seems most proud of is the people who have come out of his lab, including more than 100 Ph.D. and postdoctoral students. One of them, for example, is now head of the chemistry department at Texas A&M, one of the best chemistry programs in the world. Another, barely 10 years out of graduate school, quickly rose to the rank of Full Professor at the University of California-Riverside and was made a Fellow of the American Association for the Advancement of Science.

Over 50 years after leaving St. John’s, Gross shows no sign of slowing down. He has a

deeply fulfilling career and has been happy in his personal life as well. He and his wife enjoy culture, dining, travel, biking, photography, and visiting their grandchildren.

He encourages others to go into research, noting that interesting problems abound “especially at the interface of standard disciplines.” Being at the forefront of academic science gives one the opportunity to provide valuable expertise to society. “There is still much to learn about the submicroscopic world where frontiers still exist and where one can have impact on health, commerce, energy, and the human condition,” he said. That impact may be very widespread, he noted. “If you work as a scientist, you may discover a drug, a new material, or a method that could affect the lives of millions of people.”

Hot Off the Press

Kyle Richardson ‘13 and **Chris Seiler ‘12** saw their research published this month. The article, with advisors **Ed McIntee** and **Henry Jakubowski**, appears in *Bioorganic & Medicinal Chemistry Letters*, **2013**, 23(21), 5912-5914.



Brookings Hall on the Washington University campus.
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Samantha Hurrle

*Falling in
love with a
beautiful
instrument*

*A revolutionary
approach*

The Art of Chemistry

**Concert Harpist Juggles Time
in Lab, Practice Studio**

Samantha Hurrle '15 is a biochemist by day but a musician by night. The Luxemburg, MN, native first picked up the harp in 5th grade, and has been playing for a solid ten years. It makes for an interesting life, much of which is spent darting between labs, libraries and practice studios.

Hurrle is not alone in combining a love of both arts and science, however. "It's not uncommon to see science students with a serious interest in music," says **Dr. Nicholas Jones**, who on occasion plays French horn with the CSB/SJU orchestra.

By Hurrle's account, her initial decision to take up the harp was not a very serious one. Instead, it was a rather flippant response to her mother's idea that she might like to

try a second instrument; Hurrle had been playing the piano since the age of three. "Lesson learned: be careful what you wish for," she said. "But sometimes you could end up with something you really love."

Hurrle will be performing with the CSB/SJU Orchestra on October 26. The orchestra will also perform the Nutcracker Ballet with the Minnesota Ballet Company in Escher Auditorium at St. John's in December. It's Hurrle's favorite orchestral piece, with the possible exception of Ravel's arrangement of "Pictures at an Exhibition".

In her spare time, she also adds other varieties to her repertoire. "I love whipping out Rascal Flatts and Lorie Line if I get

some leisurely time to play," she said.

In addition to concert hall performances, she has also played in hospice care and nursing homes; she treasures the responses she has received from these patients. "The smiles and kind words I have gotten from them are the best rewards ever."

In her spare time – and she does have some -- Hurrle loves being outdoors. "Swimming in Lake Sag and walking/running on the Arboretum trails are some of my favorites," she said. She also enjoys writing. Hurrle's post-graduate plans include medical school; ideally, she would like to complete an M.D./Ph.D. program. It seems like a suitable goal for a multi-talented student.

Chemistry Curriculum Moves to Next Phase

The chemistry department has begun offering its new "in-depth" courses for juniors and seniors. In-depth courses, as recommended by the American Chemical Society Committee on Professional

Training (ACS-CPT), are meant to build on foundational coursework covering the five traditional sub-disciplines of chemistry.

CSB/SJU has taken the approach of using topical themes that blend these sub

-disciplines in order to convey how chemistry is practiced in the new millennium. For example, new in-depth courses include Xenobiotic Metabolism, Molecular Design and (continued page 9)

Bon Voyage, Mon Chimie

Jamia Moss, Contributing Reporter

Contrary to popular belief, chemistry majors do have a little time away from their books. Some prefer to use that time to travel.

About half of chemistry and biochemistry majors study abroad. Although the majority spend a semester away from campus, some choose other options. May term trips are available for those who feel they have a tight schedule. Service learning trips abroad are also good opportunities; they are offered over spring break as well as during summer.

Two big trips among the students this year were the Spring Break Volunteer Trip to Nicaragua and the Summer Research Program at Southwest University in Chongqing, China.

Hasini Kalpage '14, a biochemistry major, travelled to China where she worked in the lab isolating bacteriophages and characterizing their proteins. While her biggest goal was to see her research published, Kalpage did not forget to

explore the culture around her as well. She said, "Initially it was hard when I couldn't properly share my ideas with my Chinese colleagues due to the language barrier. But now I believe that helping them learn English was one of the most rewarding experiences." She also found a passion for research; she plans to continue on to graduate school to study molecular genetics.

Gabriel Amon '15, a chemistry major, stayed closer to home. He traveled to Nicaragua in hopes of practicing Spanish and working as a medical volunteer. Living in the home of a local family was his favorite part of the experience. He shared, "I enjoyed being placed in a family's house that did not speak any English so my only way to communicate with them was through my Spanish." His plans for the future are split between attending graduate school for environmental chemistry or attending medical school.

Study Abroad Comes in Different Sizes



Mai Chee Vang '15, another chemistry major, also took the trip to Nicaragua. She, however, worked with the dental team onsite. She also had a great time interacting with her host family and left with a much bigger vocabulary. She said, "This experience has impacted me by teaching me more about different cultures and showing how people in the United States take little things for granted."

(l-r) Majors Mai Chee Vang and Jamia Moss along with Sherelle Smart and Megan Murphy

For some, the time abroad served as a way to cement their plans for the future. For others, it was simply a fun and meaningful way to experience another culture.

New Courses in 2013-2014

(from page 8) Symmetry & Spectroscopy.

Meanwhile, the foundation level has undergone an additional round of peer review, with external evaluators examining

online and classroom materials for the Structure and Reactivity courses. The reviewers also looked at lab manuals for the Purification and Synthesis laboratories.

Initial response to the curriculum has been positive. In its latest periodic report on our department, ACS-CPT states that "the curriculum redesign is integrative, innovative, and potentially revolutionary."

*Immersed in
the wonders of
water and
chemistry*

Ramirez Leads Breakthrough Chem Class

Some St. Paul eighth graders were immersed in chemistry this summer as a dynamic young teacher led them in a course through “Mystical Waters”. CSB sophomore **Leslie Ramirez '16** chose the theme of water to engage a group of high-achieving students from low-income homes.

To interview for the position, Ramirez had to engage in teamwork with other applicants while supervisors observed. She also had to prepare a mock lesson for the classroom, an experience she describes as nerve-wracking but fun.

Ramirez worked with two classes of ten students each.

Topics included the periodic table, bonding and solutions. She was paired with an instructional coach to review her lesson plans ahead of time, but she prepared her own lessons and labs.

Ramirez was inspired by the opportunity to teach in the program. “I came from a single parent home and I knew what it was like trying to apply for college with no one in my home being able to help me.” At the end of the summer she received thank-you notes from some of the students, which was a highlight of her experience.



Leslie Ramirez

Ramirez hopes to work in health-related research someday, but says her summer has made her think about the possibility of teaching in the future.

SUMMER WITH PHARMA GIANT



Yuan Huang

Yuan Huang '14 took a break from chemistry this summer. The CSB student had the opportunity to work in the marketing department at Bristol-Myers Squibb, the pharmaceutical giant. A family friend, who works in the marketing department, suggested Huang apply for a job as an intern in the

company’s Southeast District Offices, located in her hometown of Ningbo, China. Her responsibilities included basic office tasks as well registering group members for meetings, preparing PowerPoint presentations, translating documents from English and attending group meetings and client meetings.

As a chemistry major, Huang did not have any marketing background before taking the job. However, the internship offered her an excellent opportunity to learn about one of the world’s major employers of chemists, and she also picked up some marketing skills. All in all, it was a very valuable experience for the CSB senior.

Focus on New First Years

A second cohort of new students has joined the department as FoCuS Scholars. Funded by the National Science Foundation under a grant proposed by **Dr. Kate Graham**, the students arrived on campus in June to take Chem 125 and Chem 201 Lab in a special, small group session.

Students listed a number of favourite aspects of the program. **Alex Madsen '17** of North Branch, MN, and **Gao Yang '17** of Minneapolis both appreciated the opportunity to bond with classmates during the summer before college. **Paige Maki '17** of Sun Prairie, WI, added that the group is like one big family.

Meredith Liu '17 is from Omaha, NE. Her favorite experiences of the summer included Taco Night and the other get-togethers planned by **Dr. Kate Graham** and **Frantz Soiro '16**. **Claire Buysse '17** of Marshall,



MN, and **Faith Kersey-Bronec '17** of Canby, OR, really enjoyed getting the chance to do science demonstrations for the St. Cloud Boys and Girls Club on Friday afternoons. For **Jenny Paul '17** of Rochester, MN, the best part of the summer was bonding with the other FoCuS students: rollerblading to SJU and back, weekly escapades at Buffalo Wild Wings, and crazy late night study parties. **Jordy Montejano '17** from Dallas, TX, enjoyed learning new chem-

istry material and applying it in lab.

When asked what distinguishes FoCuS 2.0 from FoCuS 1.0, **Rejene Giinther '17** of White Bear Lake, MN, and **Emma Bonglack '17**, from Bamenda, Cameroon via Brooklyn Park, MN, agreed that bigger is better. There are a few more people this year than last; more people means more diversity and more friends for hanging out after lab.

New FoCuS
Meets Original
FoCuS

Student Summer Experiences

(continued from page 5)

In the industrial arena, **Ellen Dean '14** worked at Federal Premium Ammunition, a maker of ammunition cartridges for sporting purposes. Dean worked with chemical engineers to optimize production processes for the explosive

charges – mainly lead styphnate.

Some students took a break from chemistry and biochemistry to develop other areas of their lives. **Christian Wilmore '15** was a referee for FIBA, the International Basketball Federation, traveling to Uru-

guay and Puerto Rico. **Katherine Maguire '15**, a regular staff member at Kennedy Kidstop during the academic year, was a lifeguard at the beach. Meanwhile, **Ian Manion '15** worked as much as possible to save money for study abroad in Japan.

Mohs At Frontier of Nanotechnology



Wake Forest's campus in autumn.
©WFU/Ken Bennett

**Using
quantum
dots to
aid sur-
geons
and their
patients**

(from page 6) research collaborators, both at Wake Forest and Virginia Tech, as well as other institutions. These contacts include researchers at Emory, Duke, and the University of Georgia.

The main thing that drives any researcher is the exciting work happening in their own lab. Currently, the Mohs lab is trying to develop some near-infrared fluorescent contrast agents that optically highlight tumors. If successful, these contrast agents will localize in tumors; they would then be detected by intraoperative instrumentation. A surgeon would then be able to obtain real-time feedback on whether the entire tumor has been removed before a patient leaves the operating room. "While I was at Emory, I was on a team of investigators that invented instrumentation to intraoperatively detect the contrast agents," explained Mohs. "A startup company is now developing this technology, which has been a very exciting experience."

Although he is just a few years into his career, Mohs has already enjoyed some

accomplishments that make him proud. At the University of Utah, he won the Wolf Prize, which recognizes a graduating doctoral student for excellence in teaching. At the end of his postdoctoral work at Emory, he was awarded a K99/R00 Pathway to Independence Award in Cancer Nanotechnology Research from the National Cancer Institute. This grant provided funding that allowed him to start a research program in nanoparticle-based contrast agent design.

The job commitment in research is time intensive. Mohs' wife, Sarah Buller '02, and two children, Annelise and Andrew are nevertheless very supportive of his career. In turn, Mohs strives to be very efficient and effective at work so that he can be fully available to them when at home.

Mohs' advice to current students is to fully embrace the liberal arts environment at CSB/SJU. He urges students to take advantage of the oppor-

tunity to work closely with truly gifted scholars across an array of disciplines. "The highly mentored scientific education that you are receiving in a liberal arts environment is an incredible opportunity," said Mohs. "It develops the skills necessary to excel if you chose a scientific career path, but it also helps shape you to be the best person you can be in any situation."

The return of autumn conjures strong memories of CSB/SJU for Mohs, bringing to mind walks in the woods under the changing leaves, football games, and the anticipation of another year of chemistry and biology labs. "I am extremely grateful for the education that I received at CSB/SJU," he said, "and in particular, the chemistry department."

Of course, Mohs can still enjoy college football in the fall. It isn't clear which side he roots for when the Demon Deacons face the Hokies, however.

Chem Club Rolls On

The 2013-14 Chem Club held its debut event September 23. The soiree was a casual pizza and trivia affair in the Ardolf "Fishbowl" Student Lounge. Upcoming events include Mole Day, October 23, as well as Chem Prom at O'Connell's on November 22. Plans in the works include a bingo night and a scavenger hunt, both with science themes.

Because of changes in the funding of campus clubs, there will be increased emphasis on

fundraising this year. The club is selling T-shirts this fall. In the past, the club was sometimes able to help send students to an ACS meeting, but that may not be possible with current funding levels.

This year, the club is powered by juniors. **Annie Luke '15** is president and **Tim Doyle '15** is vice president of the club. The secretary is **Marie Nilles-Melchert '15**; **Tom Steichen '15** and **Jeff Bowers '15** serve as co-treasurers.



Club advisor **Dr. Alicia Peterson** is excited about the energy of this group. "They have so many ideas. It's going to be a great year!"

From Left: Luke, Bowers, Doyle, Steichen and Nilles-Melchert

Chemical Kinetics

A Focus on Student Athletes

Several chemistry-affiliated students are running cross-country for CSB/SJU this fall. The sport isn't glamorous, but that's part of the appeal, along with the undeniable independence of the athletes.

"What I love about cross country is that you get what you give," said **Isaac Secor '16**. "There is no chance bounce of a ball or poor call by a referee to blame a poor performance on."

That isn't to say there is any lack of camaraderie among the runners. "The bond you form with your teammates when you

are out on an 18 mile run on a cold January morning is something I will never forget," said **Caleb LeClaire '16**.

Other members include **Mel Quintanilla '15** and **Bailey Drewes '15**, a double major in nutrition and biochemistry.

As many athletes will attest, being involved in sport requires good time management. "It forces me to be very productive when I do have open time," said LeClaire. Others agreed: the time invested in sports pays dividends in the classroom.



Drewes (left) and Quintanilla



Alum Notes

News From Chem & Biochem Students of the Past

The Cavendish Chronicle

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Francis Insaideo '99 is a National Institutes of Health Post-Doctoral Fellow at Columbia University Medical Center. Insaideo earned a Ph.D. in biochemistry from Notre Dame. **Bridget Charbonneau '01** has accepted a new position at Eli Lilly. She has a Ph.D. in microbiology from University of Iowa and M.P.H. in epidemiology from University of Minnesota; she just completed post-doctoral work at the Mayo Clinic.

Bryan Johnson '02 is a manager and scientist at the biotechnology company R&D Systems in the Twin Cities. Johnson did his Ph.D. work in X-ray crystallography in the Department of Biochemistry, Molecular Biology and Biophysics at the University of Minnesota. **Ben Steil '02** is working at Global Vaccines in Durham, North Carolina. Steil has a Ph.D. in Microbiology and Immunology from the University of Colorado at Denver. **Jon Siverson '03** has opened Siverson Dental Care in

Woodbury, MN. **Gina Fasching '04** is in pharmacy school at the University of Minnesota. Previously, she worked for several years at Ecolab.

Jon Freeman '04 is an Assistant Professor in the Chemistry Department at Pacific Lutheran University. Freeman earned a Ph.D. in chemistry from the University of British Columbia. **Britt Peterson '04** is a new field engineer for Agilent. She is trained on GC-MS repair and maintenance and will be undergoing training on LC-MS in the near future. She is based in Minneapolis. **Jeremiah Scepianiak '05** is a Visiting Assistant Professor at University of Connecticut. **Steve Bischof '06** has joined Chevron Phillips Petroleum as a research scientist. Bischof earned a Ph.D. from the Scripps Institute, Coral Gables, FL. **Steven Henle '06** is a post-doctoral fellow at Harvard Medical School. Henle earned a Ph.D. in neuroscience from Mayo Graduate School.

Grad Launch

Krista Barzen-Hanson interned at NASA Ames Research Center over the summer, working on the development of a DNA sensor using monolayer graphene. Currently, she is attending Oregon State University for graduate work in environmental analytical chemistry. **Will Breen** was accepted to the prestigious MD program at the Mayo Medical School in Rochester, MN. **Andrew Calascione** is in the PhD program at North Dakota State University, where he will be working in inorganic chemistry or materials chemistry. **Abby Gauer** is in pharmacy school at the University of Iowa. **Beth Grega** is

working at the Mounds View location of Medtronic as a Project Coordinator for the Safety Department. **Rebecca Henle** is in a post-baccalaureate tech position in a biochemistry lab at the Mayo Clinic. She plans to apply for graduate school in molecular genetics in a couple of years. **Kate Kaiser** is serving with the Minnesota Reading Corps as an Elementary Literacy Tutor at Delano Elementary for the next year. **Jen Marple** is attending Tulane University for graduate work in materials chemistry. **Marissa Oram** is working as a vet assistant at Dakota Pet Hospital and is also volunteering at the Animal Humane Society. She will be applying to veterinary

Notes From Our Most Recent Graduates

school next fall. **Lukman Sanusi** has accepted a position as a computer programmer with Atomic Axis in Austin, TX. **Damiene Stewart** is a field chemist with North American Service Group in Elk River, MN. **Matt Syverson** is continuing his employment at the St. Cloud Hospital in the ER. He plans to apply to Doctor of Osteopathic Medicine programs this year. **Haosen Wang** worked in the laboratory of Dr. Richard Kaner at UCLA over the summer. He is continuing there in the fall for a PhD in materials chemistry.