



Jill Kerrigan '12 in Venice

- **CSB/SJU is a leader in study abroad**
- **US News & World Report's Best Colleges 2010 Rate CSB 25th in U.S. for Commitment to Teaching**

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Alum's Destiny Forged in South Africa

Erica Layer '06 always knew she would go to graduate school in chemistry and do cutting-edge research, but her life took a different road somewhere in the northern Transvaal region of South Africa. After her junior year at CSB, she did undergraduate research at Stanford and seriously thought about returning there for a Ph.D. Immediately after graduation, however, she put off graduate school and joined the Peace Corps as a 'School & Community Resource' volunteer in South Africa. During two years spent living in a rural village at the base of a mountain in Limpopo province, she was responsible for a variety of tasks. She worked for nine months with community



Erica Layer (right) in South Africa as a Peace Corps Volunteer.

members, traditional leaders, youth and government officials to plan an HIV-testing campaign that brought over 2,000 people together. Along

with local youth leaders, she facilitated a life skills course for 30 teenagers, and held ongoing workshops for primary school educators in three villages. She also spent six months teaching chemistry at the local secondary school.

While in South Africa, Layer became increasingly interested in the field of HIV/AIDS and wanted to gain some experience at the international level. After the Peace Corps, she was offered a job at the International AIDS Society in Geneva, Switzerland. Her initial position involved editing manuscripts submitted to the Journal of the International AIDS Society. Impressed with her science background, her superiors (*see Erica, page 2*)

SUR Program Posts Record Participation

The ranks of students doing summer research in the chemistry department swelled this summer to a total of sixteen, including two exchange students from China. These large numbers were partially supported by additional grants obtained by department members this year. Some funding was obtained through CSB/SJU Rooney grants set up to

promote research on campus with potential biomedical applications. These grants were awarded to **Dr. Mike Ross, Dr. Brian Johnson, Dr. Henry Jakubowski, Dr. Ed McIntee, Dr. Alicia Peterson** and (collaboratively) **Dr. Kate Graham** and **Dr. Nicholas Jones**. In addition, **Nate Louwagie '11** was supported by funding from the

Honors Program. He had worked previously with Jakubowski, studying inhibition of low molecular weight protein tyrosine phosphatase (LMW-TP), which is significant in certain cancers. This summer, he shifted focus to the synthesis of new inhibitors of LMW-TP under direction from McIntee. He was joined on the (*see SUR, page 4*)

Erica Layer in Peace Corps



Scenery in Limpopo province. (Wikipedia photo)

Layer was inspired to combat HIV by practical experiences in South Africa and Switzerland

(from page 1) tapped her to coordinate the scientific program for the International AIDS Conference. She worked with leading HIV scientists from around the world to organize

sessions, invite experts to speak, and develop the content of over 30 sessions ranging from HIV pathogenesis to epidemiology to human rights of people living with HIV. While in Geneva, she had the opportunity to work with people from the United Nations, the World Health Organization and other international agencies.

After a year and a half in Switzerland, Layer returned

to the U.S. in July to start a master's degree at the Johns Hopkins Bloomberg School of Public Health. She is focusing on public health interventions for HIV-prevention and maternal and child health in developing countries. The two year program entails one year of intensive classes followed by a year of field work. She hopes to travel to Malawi next year to research the impact of male circumcision on HIV transmission.

Layer's time at CSB was marked by diverse activities. She developed analytical and problem solving skills in her chemistry classes that she still uses every day, but she got even more out of college than that.

During one summer she did undergraduate research, but

over another she helped plan orientation activities for the incoming class. In what was to be an initial taste of Africa, she organized a trip to Uganda with a group of students. Nevertheless, she never imagined that she would end up studying public health and African issues. She joined the Peace Corps as a way to see the world and challenge herself to learn about a new culture and place. However, the irreplaceable experiences she had there and in Geneva guided her path in new and positive ways. As she settled into a new semester in Baltimore, she took the time to reflect that what she was looking for all along was something she could feel passionate about.

McKenna, White Take Leadership Posts

Two members of the chemistry department have been given assignments outside the department for the current academic year. Associate Professor Anna McKenna, who teaches general and inorganic

chemistry, has been elected vice-chair of the faculty senate. Her anticipated elevation to chair of the senate for the following year will bring her assignment to two years total. McKenna will also serve on the CSB Board of Trus-

tees, with special responsibility for planning, financial and budgetary issues.

Associate Professor Richard White, Competitive Fellowships Advisor and Director of the Honors Program, has been appointed to a one year term as Undergraduate Research Program Director. The inclusion of this position in his portfolio brings together a variety of activities that engage students in the pursuit of academic excellence.

A collateral result of these appointments is a reduction in teaching loads

for both popular instructors.

McKenna is teaching fewer sections of introductory structural chemistry than originally scheduled. White, who has been teaching thermodynamics in the fall for the past twenty years, will still be teaching the laboratory portion of the course, but not the lecture.

McKenna



White



Seballos Joins CSB/SJU Chemistry Department

Dr. Leo Seballos, the newest tenure-track member of CSB/SJU's chemistry department, is looking forward to the academic year. It will not be without its challenges: this year he will be teaching thermodynamics, quantum mechanics and introductory structural chemistry as well as a traditional semester of quantitative general chemistry. It's a heavy load, especially for a new Assistant Professor, but he is confident that he is up to the task.

Seballos did his graduate work in the laboratory of Dr. Jin Zhang at the University of California, Santa Cruz where his studies focused on understanding molecular behavior for optical detection applications. "It is exciting to see that the work we have done is contributing to the development of the latest in scientific technology" said Seballos about his graduate work. "I can't wait to see how far this research will go to develop instrumentation that can detect things such as pesticides, explo-

Dr. Leo Seballos in the Ardolf Science Center

sives or contraband."

Seballos went on to do a one year post-doctoral study under the direction of Dr. Eric Majzoub at the University of Missouri, Saint Louis, where he worked to develop materials for hydrogen storage. He later accepted a temporary analytical and general chemistry teaching position at Illinois Wesleyan University prior to coming to CSB/SJU. When asked what inspired him to choose a career in teaching, Seballos said, "I like applying chemistry to make things, but I enjoy teaching and showing students the wonderful things



we can do with chemistry even more."

Originally from Los Angeles, Seballos anticipates some adjustments to living in small-town Minnesota. An avid bicyclist, he spent the summer traveling along the West coast and the mountains of the Pacific Northwest before settling into his office in Ardolf Science Center to prepare for his fall classes. "I will miss the majestic ocean, but I look forward to visiting the majestic lakes here."

"I like applying chemistry to make things, but I enjoy teaching and showing students the wonderful things we can do with chemistry even more."- Seballos

Longtime Instructor Passes Away

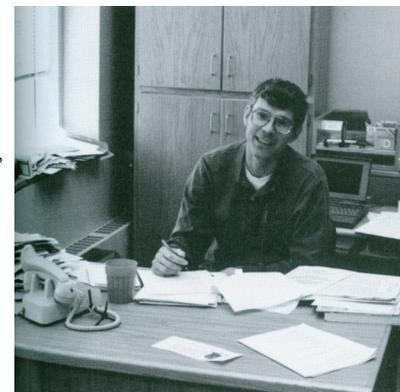
Dr. Richard Jochman passed away in December, 2009. Jochman, who taught organic chemistry in the department from 1977 -2000, had been battling multiple sclerosis for some time and succumbed to complications of the disease and other health issues. A graduate of St. Norbert College in Wisconsin, Jochman went on to earn a Ph.D. in medicinal chemistry from the University of Kansas. Early in his teaching career at CSB/SJU, he also

served as the Blazers' basketball coach. Students remember him as a caring instructor with a passion for science; he was an avid reader of the scientific literature who loved to share new discoveries with his class. He is survived by his wife, Nikki Jochman, as well as his son, Kyle, and a granddaughter.

The Richard Jochman Endowed Scholarship Fund has been established in memory of the former chemistry professor. The award will be given to top

chemistry majors meeting the highest standards in organic chemistry courses. The award was established by **Paul Zenk '78** and his wife, Kathleen Weatherstone. Zenk, like Jochman, graduated with a Ph.D. in medicinal chemistry from University of Kansas and went on to work in industry.

Dr. Jochman in his office in PENGL, about 1988.



SUR Program Offered Variety of Experiences

A group of SUR students in Ardolf



Research problems ranging from groundwater decontamination to magnetic nanoparticles

Foehrenbacher (left) and Zhang head to the lake



(continued from page 1) project this summer by Shirin DeSouza '12.

Other students continued work from the previous summer. Tim Juba '11 and Zach Lauer '11 rejoined Ross in their studies on the photodecomposition of pharmaceuticals in wastewater streams. Mardi Billman '11 furthered her work with Johnson on inorganic model compounds for multicopper oxidases, proteins that utilize the conversion of atmospheric oxygen to water.

Lindsey Firman '11 continued developing Barbier-Prins methodology for a synthesis of the natural product, kumepaloxane, under Graham and Jones. She was joined in these investi-

gations by new researcher Ben Eidenschink '12.

Students engaged in a variety of other research areas. Hang Zhang '11 and Mikala Foehrenbacher '12 worked with Peterson on rhodium catalysts that can dehalogenate organic contaminants in groundwater. These compounds can seep into groundwater from industrial sites that use halogenated solvents. Joe Gair '12 worked with Dr. Chris Schaller to synthesize ruthenium alkyl hydride complexes as models for C-H activation catalysts. Rachel Seurer '11 studied the interaction of opsonins such as albumin and fibrinogen with magnetic nanoparticles used for magnetic imaging and other applications. She worked under the direction of Dr. Abul Fazal. Junior Peter Ly '11 investigated the heavy metal content and fatty acid composition of egg yolks from locally produced eggs with Jones, Graham and Jayne Byrne of the Nutrition Department. Eric Uzelac '12 looked at the Lewis acid-catalyzed cyclization of propargylic acids with Dr. Jones.

Two students participated in the Summer Research Exchange Program. While in China, Michael Freeman '11 worked with partner Jing Sun on organocatalyzed asymmetric aldol reactions under the direction of Dr. He Yanhong of Southwest University (SWU) in Beibei. Back at CSB/SJU, the pair joined Dr. Jakubowski to study the binding of small synthetic

inhibitors of protein-tyrosine phosphatase, a ubiquitous regulatory agent in cell cycle control. Jill Kerrigan '12 worked with aptamers for detection of small biomolecules under the supervision of Dr. Xiang at SWU. She and her SWU partner, Gao Jiuzhi, returned to Minnesota to study of the photodecomposition of pharmaceuticals with Dr. Ross.



DeSouza in lab

Providing summer research opportunities in chemistry at CSB/SJU provides invaluable training for students, whether they ultimately head to graduate school, health professions or clinical and industrial laboratories. Alumni report that these experiences increased their sense of confidence and enhanced their problem solving abilities. With an increasingly large fraction of the faculty actively engaged in research, the department hopes to sustain the momentum gained this summer and provide opportunities for a significant number of our students.

Off-Campus Experiences Take Many Forms

A look at some CSB/SJU chemistry and biochemistry majors shows the broad range of summer opportunities available to students. **Alex Hansen '11** explored biotechnology at Calwest Seeds in West Salem, WI, developing a proof-of-concept experiment on gene insertion methods. He used an agrobacterium to insert a genetically designed plasmid into a cloned strain of Alfalfa, selecting the new plant cells with the help of antibiotics. After embryogenesis on a growth medium, the plants were ready to be placed in soil. Hansen is continuing this work during the fall semester. He hopes to pursue agriculture-related scientific studies after graduation, either in mainstream biochemistry or in viticulture and oenology.

Sara Kokkila '11 originally planned to go to medical school. That all changed after she did quantum chemistry research in NASA's Undergraduate Student Research Program at Ames Laboratory in California. She investigated the absorption of greenhouse gases, particularly hydrofluoroethers and hydrofluorocarbons, using *ab initio*



Mordorski (second from left) with Zhang lab at U Missouri

quantum mechanical methods. From this data, she created group increment models to describe a molecule's absorption within the atmospheric infrared window. These models can aid in developing benign substitutes for halogenated compounds. The work has excited Kokkila's interest in pursuing graduate studies in theoretical chemistry.

Breanne Mordorski '12 conducted research in Dr. Shuqun Zhang's lab at the University of Missouri – Columbia. She worked on identifying MAP kinase phosphorylation sites in ERF transcription factors in Arabidopsis. ERF binds DNA and regulates expression of other proteins. Her work involved generation of mutants to control the sites

available for phosphorylation. Labeling studies with radioactive isotopes were used to track whether phosphorylation could still occur. Mordorski ultimately plans to attend medical school, and felt this biomedical research project was a perfect complement to her interests.

Students' scholarly work this summer was not limited to science. **Redmond Fraser '12**, an Asian Studies minor, took part in CSB/SJU's Summer Research Exchange Program in China. Working under the direction of Professor Luo of Southwest University in Beibei, China, and Professor Geng of CSB/SJU, Fraser and SWU partner Yan Chinghao studied the imagistic style of Chinese poetry. The two also tried to discover connections between Chinese and American poetry.

Whether in agribusiness, a government or academic lab or the lines of Chinese poetry, CSB/SJU chemistry and biochemistry are finding experiences that complement their education.



Fraser (left) in China.

Additional Instructors Hired for General and Organic Chemistry

High enrollment in first- and second-year chemistry courses has necessitated additional hires in the chemistry department. About 340 students registered for general chemistry, with an additional 145 taking organic. Dr. Bornface Gunsaru will be teaching organic chemistry lecture and laboratory this year. Gunsaru recently obtained his Ph.D. in chemistry from Portland State University, working in the laboratory of Prof. David

Peyton on the development of new antimalarial drugs. He helped develop and patent several antimalarial candidates during graduate school. A native of Zimbabwe, he recently obtained his U.S. green card ;



Gunsaru

previously, he was on a student visa.

In addition to Gunsaru, Dr. Bradley DeLeeuw continues to help out in general chemistry, as he has for the past few years. DeLeeuw was a graduate of U MN-Morris and earned a Ph.D. in theoretical chemistry from Georgia under Paul Schleyer. He lives in Morris, where his wife is an environmental engineer.



DeLeeuw

**Genetic Design
of alfalfa,
environmental
modeling,
transcription
factors and
poetry**

My Summer Vacation and Other Adventures



Gannon McGrath in Chile

Wilderness adventures, dance classes, shadowing and an Ecuador trip — Oh, the places you'll go!

Abi Passe in Ireland



Abdinasir Abukar '11 took classes at U MN. **Moses Adeagbo '12** and **Ned Colosky '11** worked in the chemistry department stockroom and developed experiments for the organic chemistry laboratory. **Andy Bailey '12** was a lead

Taekwon-Do instructor for Premier Karate in Andover, MN, and worked on his next belt in combat hapkido. He also worked at Lowe's Home Improvement and took a physics class.

Mardi Billman '11 studied for the GRE and researched graduate schools. **Jacob Denning '12** hid out in the badlands at the Bully Pulpit in Medora, ND. **Ben Eidschink '12** studied ecological diversity on a May Term course in Ecuador led by Dr. Timmerman of the biology department. **Khadija Fernandez '12** returned to Trinidad and Tobago to work at a science camp with children aged 5-12. She also returned to her old dance school to perform in some shows and run a dance camp for ages 5-9.

Lindsey Firman '11 took the PCAT and applied for pharmacy school. **Khris Grant '11** studied for the MCAT and did some shadowing at the hospital in Winona, Minnesota. **Jen Grier '12** did some job shadowing. **Dustin Hansen '11** continued his work with Les Voyageurs, training and leading a group of eight 16 year olds on a one-

month wilderness expedition in Manitoba and Ontario. **Betsy Hutchinson '11** worked as a pharmacy technician and applied to pharmacy school. **Ben Jagger '11** applied to dental school.

Sara Kingston '11 worked in a dental office in Minneapolis while applying to dental school. **Aaron Koenig '12** worked for CSB Facilities Maintenance. **Christine Lucachick '12** did some dental assisting, took the DAT and returned to her "awesome job" at Camp Kooch-iching. **Peter Ly '11** took the MCAT and applied to medical schools.

Malinda Madery '11 worked at a hospital and shadowed a pharmacist. **Gannon McGrath '12** hosted a study abroad student from Chile, performed in various orchestra ensembles and was a counselor for MMEA All State.

Abi Passe '12 worked at a nursing home as a CNA and at a pool as a lifeguard. **Jake Petersburg '11** took the MCAT and applied to medical school. **Valdez Rahming '12** went home to Nassau, took some humanities classes and studied firsthand the effects of global warming on Bahamian beaches.

Danelle Rolle '12 worked for Fine Arts Programming as a house manager and box office assistant; **Matthew Semerad '12** did the same. **Elana Simonson '12** hosted a friend from Spain for a month, did some camping and taught swimming and

lifeguarding at the YMCA in Rochester. **Steven Sour '12** went road tripping to Seattle, with camping stops along the way, including Glacier National Park. **Kui Sun '12** spent the summer at home in China, where he received a visit from his organic lab partner, **Redmond Fraser '12**. **Jen Swann '12** nannied and worked in a dental office.

Charlie Swanson '11 was a CSB/SJU Orientation Coordinator and played a lead role in the orientation video "Oh, The Places You'll Go". He studied for the GRE and plans to apply to graduate school in forensic science. **Hang Zhang '11** did some travelling in Europe and took the GRE.



Away From The Desk

A number of chemistry and biochemistry majors are off-campus this fall. **Andy Bailey '12** is in the Greco-Roman program this fall. **Jen Grier '12** is in the Austria study abroad program. **Jill Kerrigan '12** is in Ireland, with a superposition of states in Venice. **Gannon McGrath '12** is spending the semester in Chile. **Abi Passe '12** is studying abroad in Galway, Ireland. **Chris Seiler '12** is enjoying the Austria program: visiting castles, climbing mountains, and learning German. **Matthew Semerad '12** is greatly enjoying his adventures in London.

Grad Launch 2010 *Chem & Biochem Majors Make Their Great Leap Forward*

Andrew Aebly is in graduate school at Montana State University. **Kevin Bettendorf** is in the Ph.D. program in biochemistry at Yale. **Steven Campbell** is a regulatory analyst in the Materials EHS Department at 3M. He prepares MSDS for 3M products. **Justin Eklund** is working as a scribe for a Minneapolis hospital. **Daryl Fields** is studying medicine at the UW-



Bettendorf

Madison.

Nicole Gagnon is in graduate school in chemistry at the University of Arizona. **Katie**

Hartjes is in the Virology and Gene Therapy Ph.D. program at Mayo Graduate School. **Amy Hogerton** is in graduate school in chemistry at the University of Minnesota (analytical chemistry runs in the family). **Anne Hylden** accepted an internship in the Advanced Radioanalytical Group at Pacific Northwest National Laboratory. She works on method development for quantifying select radioisotopes in environmental materials.

Hadley MacIntosh is in graduate school at the Virginia Institute of Marine Sciences. **Alex Moher** is continuing his 3-2 engineering program at Iowa State University. **Nathan Ortman** took a summer internship with Ecolab, with plans to study

Clinical Laboratory Science at U MN. **Sarah Parker** is working at General Mills. **Luke Steiner** is working as a business consultant on health care issues for Ingenix Consulting, part of UnitedHealth Group. **Stephanie Roe** is in graduate school in chemistry at U MN. **Courtney Tiegs** accepted a position as a consumer safety officer for the FDA. She will be conducting inspections and investigations in production industries.



Tiegs

Grad school, med school, healthcare consulting and consumer safety

Rioux Retires

Teacher, Scholar, Quantum Mechanic Taught for 42 Years

Dr. Frank Rioux, whose intense interest in quantum mechanics permeated his teaching, has retired from the CSB/SJU chemistry department. He had been an instructor in the department since 1968.

A Chicago native, Frank showed his dedication to education in high school when, after working as a film runner in games one and two of the 1959 World Series, he declined the invitation to return because he would miss too much school. The White Sox, shaken by this lack of support, quickly crumbled against the Los Angeles Dodgers.

After graduating from Bradley University in Peoria Illinois in 1964, Frank attended Iowa State University and earned a Ph.D. in physical chemistry in Bernie Gerstein's laboratory. He began teaching at CSB/SJU

after completing his experimental work at Iowa State. He recalls being eager to apply for the new position because of his high regard for SJU alumni he knew in grad school.

Frank quickly morphed into a computational/theoretical chemist and consistently contributed to the scholarly activity of the chemistry department. Over the course of his career, he was the author or co-author of over fifty publications. His work appeared in a variety of journals, including *Journal of Chemical Education*, *The Chemical Educator*, *The American Journal of Physics*, *Journal of Chemical Physics*, and *European Journal of Physics*.

Frank and his wife, Gayle (a retired early childhood educator), have purchased a retirement home in Wisconsin where their son, Dennis, and his family

live; Dennis teaches physics at UW Oshkosh. The Rioux's regularly visit Rapid City to see daughter, Laura (employed at a veterinary clinic) and her family. They also travel to the Big Easy, where son Paul reports for the *Times Picayune* of New Orleans.

When not catching up with family, Frank plans to continue running, keep up with the scientific literature, calculate and write. Currently, his main areas of interest are quantum optics and the origin of the fundamental concepts of quantum theory.

Dr. Frank Rioux (left) and Prof. Emeritus Mark Hughes (chemistry) at Dr. Rioux's retirement celebration



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The College of Saint Benedict
Saint John's University

New NMR Up & Running

The chemistry department has purchased a new nuclear magnetic resonance spectrometer. The instrument is a JEOL ECA-400 400 MHz spectrometer. It replaces the Varian 300 MHz instrument purchased in 1996. The newer instrument offers greater resolution, ability to monitor additional nuclei, and gradient shimming. It also features an automation system, useful for running hundreds of spectra each semester for organic laboratories.

The installation process met with some delays. An unexpected surge in orders

led to a production backlog in Japan. That in turn meant installation was not completed in May as originally planned, but late in the summer. Nevertheless, grant PI Dr. Edward McIntee is pleased with the data from the new NMR, and in particular with the rapid acquisition of 2D spectra made possible by the instrument.



Our new celebrity:
the JEOL ECA-400

Alum Notes

What Some Grads From the Past Are Doing Now

After working for a year at Guidant Analytical in Minnesota, **Steve Bischof '06** joined Roy Periana's lab for Ph.D. studies on C-H activation at the University of Southern California. He has since moved with the lab to the Scripps Institute's Florida campus. **Chris Brueske '00** is currently Assistant Division Director in the Public Health Laboratory of the Minnesota Department of Health in Saint Paul, where he has worked since 2002. **Pamela Carroll '02** is a physician at the Health Centre for Women in Nassau, Bahamas. **Keely (Sacry) Hoban '07** has returned to Minnesota for clinical rotations while finishing her optometry studies at Pacific University in Oregon. **Annalisa Jordan '04** and **Jennifer Klein '02** are Visiting As-

sistant Professors in Chemistry and Biochemistry, respectively, at St. Olaf College. **Aaron Mohs '02** graduated with a Ph.D. in pharmaceuticals and pharmaceutical chemistry from the University of Utah and is currently a Distinguished Fellow at the Center for Cancer Nanotechnology Excel-



Don't stay out there on your own! Let us know where you are these days.

lence at Emory University. **Dorian Nelson '01** has joined HB Fuller as a research scientist. He will be working in the reactive chemistry division on projects for long-range development. He joins fellow SJU and U MN graduate **Peter Simone '04** at HB Fuller. Simone recently finished his Ph.D. in polymer chemistry in the laboratory of Tim Lodge at UMn. **Thomas Tekavec '02** earned his Ph.D. in chemistry in Janis Louie's lab at University of Utah and is working at Nalco, a leading company in water treatment and energy efficiency. **Tina Veek '04** graduated from Medical College of Wisconsin and is doing her residency in York, PA. **James Wollack '04** is an Assistant Professor in Chemistry at College of Saint Catherine.