

Worldwide health close to home



UW-L Student Evacuated From Sierra Leone in the Wake of Ebola

UW-L Master of Public Health student Alexandria Berg was in West Africa teaching youth about public health when a public health emergency began to unfold around her.

Berg was completing her Graduate Community Health Preceptorship

experience in Freetown, Sierra Leone, when the deadliest outbreak of Ebola in history took hold in West Africa. With help from UW-L, Berg secured the last seat on a plane out of the country.

Berg's UW-L Adviser Gary Gilmore, director of Graduate Community Health and Public Health Programs, in collaboration with the Office of International Education and senior

university leadership were monitoring the situation. When the Department of State issued a travel warning and the World Health Organization and the U.S. Centers for Disease Control and Prevention clearly declared an epidemic of unusual proportions, it was determined that for Berg's continued safety and well-being, she needed to depart the country, says Gilmore.



6. 5 things to know about UW-L's PA Program

A top-ranked program nationally, which partners with local hospitals to meet the national demand for future PAs.



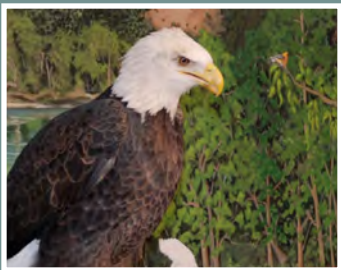
14. PE teacher ed using professional school model

The UW-L Physical Education Teacher Education (PETE) program has been a state and national leader in preparing physical education teachers for decades.



22. Biology + Math = Research

In 2012, faculty members primarily from UW-L's Biology and Mathematics departments began to meet weekly as a way of fostering research collaborations between the two.



26. Researchers in rex Lab explore how dinosaurs once moved

Eric Snivley, UW-L professor of Biology, and his team of student researchers in UW-L's rex Lab are uncovering more about what dinosaurs were really like.

COVER PHOTO:

UW-L student Alexandria Berg, back row, center, pictured with West African Medical Missions staff members and people from a local clinic in Sierra Leone. WAMM received this donation of medical supplies for the clinic.

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CLASS NOTES POLICY

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Physics Department is No. 2 in the nation for granting degrees

UW-L is ranked No. 2 in the nation for the number of physics degrees it awards annually among bachelor's degree granting programs.

UW-L had an average of 28 physics majors a year between 2010-12, placing it second to the U.S. Naval Academy, which took the top spot with 30, according to the list from the American Institute of Physics.

Not only that, UW-L has the second-most physics majors in the state of Wisconsin — second only to UW-Madison. UW-L has consistently placed among the top five on the national list, tying for fifth place for classes graduating from 2006-08 and third for classes graduating between 2008-12.

The recognition shows that UW-L is helping meet a high demand for graduates in the STEM (science, technology, engineering, and mathematics) fields, says Gubbi Sudhakaran, chair of UW-L's Physics Department.

"A well-trained workforce is crucial for economic prosperity, and physics graduates exhibit skills and knowledge that are highly valued in the marketplace," says Sudhakaran. "Our graduates are well suited to provide innovation in industry; to achieve advanced degrees in a variety of fields such as physics, engineering, medicine or law; and to educate the next generation of scientists and engineers."

The Physics Department's success at graduating high numbers stems from strong recruitment and retention, as well as a variety

of degree options that makes the program appealing to students with broad interests.

The department offers specialty tracks in astronomy, computational physics, optics and physics education. It offers concentrations in biomedical and business, and dual-degree options in physics/engineering and physics/physical therapy.

Sudhakaran also commends students, faculty and staff for their efforts.

"We strive to create a supportive, scholarly community that provides many opportunities for students to work with faculty on cutting-edge research projects, to participate in student organizations and to attend seminars and guest lectures by world-class scientists and engineers," notes Sudhakaran.

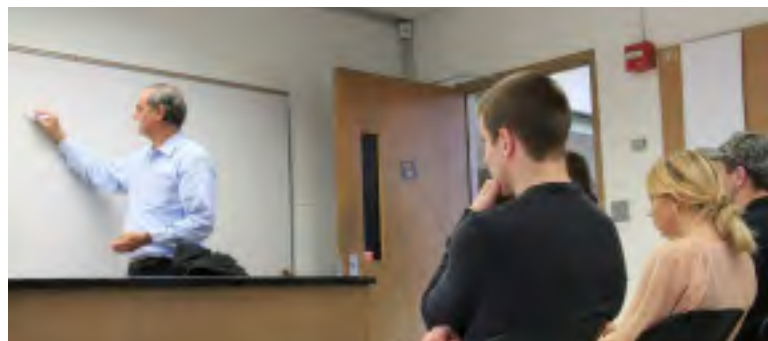
For the 15th year in a row, this past Fall, the Physics Department welcomed a Noble Prize Winner to meet with faculty, staff and students and give a public lecture. Nobel Prize Winner Adam Riess was on campus October 2-3.

In addition to attracting prestigious guests, the program continues to uphold a national reputation for physics education.

In 2013, the program was awarded the American Physical Society Award for Excellence in Undergraduate Physics Education, which recognizes physics programs that support best practices in education at the undergraduate level.

In 2012 the program was cited by the American Institute of Physics Career Pathways Project as a model program with regard to its success in placing its graduates into STEM careers.

Previous accolades also include recognition from the National Task Force on Undergraduate Education in 2003 and the 2004 Teaching Excellence Award from the UW System Board of Regents.



Nobel Prize Winner in Physics David J. Wineland visits a UW-L class in fall 2013.

Highest number of physics degrees awarded — bachelor's degree granting programs

1. United States Naval Academy 30
2. University of Wisconsin-La Crosse 28
3. St Olaf College 24
4. SUNY College at Geneseo 22
4. Carleton College 22
5. University of Wisconsin-Eau Claire 21

Worldwide health close to home

CONTINUED FROM THE COVER

Berg understood it was time to go, but it was hard to leave, she says. She had been in Freetown for her preceptorship experience since early July teaching a Young Scholars program for the West African Medical Missions (WAMM). Berg taught high school-aged youth about human biology, immunology, diseases — including Ebola, and social determinants associated with the diseases.

“I was very sad to leave because I had built such good relationships with everyone there,” she says.

Berg was never worried about contracting Ebola. She wasn’t caring for patients or in contact with anyone who had it. Instead, her focus was health education.

Citizens had a lot of misinformation about Ebola, says Berg. Although the virus spreads by touching blood or bodily fluids of someone who is sick or has died from the disease, she saw people wearing gloves just to shake hands or exchange money. She and WAMM invited a physician, who was practicing at local hospital in Freetown, into the Young Scholars program classroom. The physician, also an epidemiologist, taught the students and local community members who attended about the Ebola virus including signs, symptoms, transmission, how to protect themselves and others.

When Berg first arrived, some people didn’t even believe the disease was real.

“By time I left, I think everyone believed it was real,” she adds.



UW-L student Alexandria Berg pictured with some of the program administrators and program assistants from the Young Scholars Program in Freetown,

Berg says she picked West African Medical Missions as her field experience because she liked the organization’s mission of strengthening local, existing health capacities and increasing health literacy. The Young Scholars program aids in the mission, through education, teaching youth about health topics so they become empowered to act as advocates for health in their community. They also discover the possibilities to become the future administrators of the program.

“I hear about some organizations that offer a two-week trip and people go help build something, which is great,” says Berg. “But I really like the mentality of engaging with the community, helping them learn and gain something they can continue to do once the help has left.”

Berg is finishing her public health preceptorship experience in the U.S. by communicating with her contacts in Sierra Leone remotely



Gary Gilmore, director of the Graduate Community Health/ Public Health Programs.

When Alexandria Berg first arrived, some people didn't even believe the disease was real. "By time I left, I think everyone believed it was real," she says.

via the Internet. She's communicated with her students regarding community outreach activities they are required to do, based on what she and other volunteers taught them. The activities included working with local clinics to increase patient flow and decrease the stigma of nurses; conducting surveys related to mental health; and infectious disease control and management trainings related to Ebola. While they've learned a lot, so has Berg.

She's developed her assessment, planning, implementation, evaluation and research skills, says Gilmore. Also, her experiences in training and managing youth have contributed to a greater sense of community engagement, he adds.

Meeting youth in the country also showed her what a privilege education is.

One student sent Berg a Facebook message about the Jeopardy game the class played on the last day after she left. His team won, and each member received a biology book to take home. The student told her he had been reading it every night.



UW-L student Alexandria Berg, second from left, pictured with members of the Ministry of Social Welfare and West African Medical Missions.

"Everyone in the Young Scholars program was so hungry for education," says Berg. "I found that eye opening and reminder for myself that I need to not take my education for granted."

Berg is on track to finish the Master of Public Health program in spring 2015. Then, she plans to begin a career in public health.



UW-L student Alexandria Berg teaches two program assistants from West African Medical Missions, Mohamed S. Kamara and Santos "Santigi" Sankoh, how to enter attendance using Microsoft Excel.



UW-L student Alexandria Berg, left, writes critical thinking questions on the board with Mary Hyland, another West African Medical Missions volunteer.



These two students in the Young Scholars Program take turns practicing part of a medical examination.



5things

to know about UW-L's PA program

National Physician Assistant week, held annually in October, it's a time to celebrate America's more than 100,000 clinically practicing Physician Assistants.

UW-L's Master of Science in Physician Assistant Studies program is a top-ranked program nationally, which partners with local hospitals to meet the national demand for future PAs.

"Even as a senior in high school, I knew that I wanted to be a PA," says Karissa Hultmark, a student in UW-L's program and president of the UW-L chapter of the Physician Assistant Student Society (PASS). "PAs are on the front line of health care, interacting with patients and working with physicians, nurses and other health care providers. I can't think of a more rewarding profession."

Above: Karissa Hultmark, left, a student in UW-L's PA program, looks on as Dr. Sandy Sieck, UW-L's PA program director, demonstrates part of an eye exam on another student Mike Toye.

Top 5 things to know:

- 1. Physician Assistants from UW-L's program are in high demand.** Since 2006 all 134 UW-La Crosse Physician Assistant program graduates — 100 percent — have become employed as physician assistants. Physician assistants have been increasingly in demand because they offer a broad range of diagnostic and preventative medical services — similar to what a primary care provider does. And it's a time when doctors are in demand because of the increasing healthcare needs of an aging population and changes in health care access.

"I think mid-level providers, including PAs, are going to be a huge part of sustaining health care in the future," says PA program student Stephanie Brandt.

- 2. UW-L's PA program is a partnership with two, world-renowned medical institutions.** In 1995 UW-L and local hospitals decided to team up to start a PA program with UW-L handling the didactic portion and hospitals — Mayo Clinic Health System and Gundersen Health System — providing clinical rotations. UW-L is fortunate to have an affiliation with these world-renowned medical institutions, a luxury the majority of PA programs nationally do not have, notes Dr. Sandy Sieck, UW-L's PA program director. In addition to offering hands-on training, the hospitals also provide feedback on curriculum and assist in selecting the program's future students.

"I chose to attend UW-L because it's the best," says PA student Michael Poterucha. "The partnership between UW-L, Mayo Clinic and Gundersen combines the resources of a phenomenal university system with two exceptional health care systems."

- 3. UW-L's PA program fills a regional employment need.** Upon graduation 123 of the 134 graduates — 92 percent — have stayed within the tri-state area (Minnesota, Wisconsin and Iowa), and are helping to meet the regional demand for health care providers.

Students in UW-L's PA program Morgan Swartz, left, and Nadia Elfessi practice checking blood pressure.

- 4. UW-L's PA program students score high.** Since 2006, graduates of the UW-L – Gundersen – Mayo PA Program have a 100 percent pass rate on the Physician Assistant National Certifying Exam (PANCE). Additionally, since 2009, UW-L graduates have scored above the national average on all subscores of PANCE.

- 5. UW-L Physician Assistant program students are top-notch.** UW-L's PA program is competitive. This year 319 applications were submitted for only 19 positions. Those who make it into the program have obvious passion for the program and PA profession.

"I believe the competitive student selection, dedicated and educated staff and phenomenal partnership sites set UW-L's PA program apart, making it one of the best in the U.S.," says student Crystal Ziegler.

The instructors truly care about student success, says PA student Chelsea Ruda. "I know I made the right decision to become a PA, and I am so excited for what the future holds," she says.

PA Student Nadia Elfessi says she is excited about a future working with a variety of patients and "bringing a smile to someone's face."

"In this profession I am able to see more patients, which ultimately means getting to make a difference in more people's lives," she says.



Marsh sounds could explain the mystery behind declining frog population

The sound of croaking frogs in La Crosse's urban marshland may help scientists better understand why amphibian populations are declining worldwide.

Near a busy city street, a UW-L student researcher wades through waist-high water into the thick of the La Crosse River Marsh. His destination is a small box with two small microphones poking out like ears on either side. Using sound to monitor ecological changes is a growing trend, especially in remote areas, says UW-L Biology Professor Roger Haro.

A small computer chip inside the box records sound for five minutes every hour — night and day. Back in the lab, advanced computer software has analyzed thousands of hours singing frogs, displaying their chorus through colorful visual patterns that offer clues about the size and diversity of the frog population. UW-L has been monitoring the sounds for the past three years in partnership with the Upper Midwest Environmental Sciences Center.

“Ultimately, we want to understand how frog species are doing,” says Biology Professor Rob Tyser. “If there are changes, we want to track the reason for the changes.”

The efforts are part of a national program launched in response to the worldwide decline in the amphibian population — the Amphibian Research and Monitoring Initiative. Researchers across the U.S. and Canada are monitoring amphibian populations in public lands to determine what factors might be leading to the decline. Little is known about how habitat changes such as highway construction or



From left, McNair Scholar Michael Fuerte and Mark Roth, biologist with the Upper Midwest Environmental Sciences Center. Monitoring frogs in the La Crosse River marsh is a partnership between UW-L, the Upper Midwest Environmental Sciences Center and the McNair Scholars Program.



Michael Fuerte, a junior biology major, has been monitoring frogs in the La Crosse River marsh for two years.

environmental stressors such as climate change affect amphibians. However, scientists do know amphibians are sensitive to environmental stressors. That's why they're a good indicator of overall ecosystem health, according to USGS.

The monitoring procedure at the La Crosse River Marsh measures not only the sounds of the ecosystem, but also water chemistry, conductivity, temperature and level.

Combining the data, UW-L researchers are interested to discover if contaminants such as pesticides, fertilizer or road salt are impacting the habitat.

They want to know if stressors such as a change in water temperature or the Chytrid fungus, previously linked to the decline of amphibians, could potentially be responsible for frog fatality.

"This research has made me realize things are more connected than I thought," says UW-L student researcher Michael Fuerte, a junior biology major. "You tend to not correlate how our actions affect the environment, but they really do."

So far Fuerte and Tyser, his faculty adviser, have found frogs are doing surprisingly well in marshland near St. James Street — despite the hum of cars on a nearby road, a train track and surrounding urban sprawl. But it's too early to see any long-term changes in the marsh ecosystem,



Researchers use this device to record sound for five minutes every hour — night and day.

notes Tyser. Fuerte has spent two years studying the acoustics of the frog population. He started as a freshman through a program called WiscAMP, which supports minority students in STEM fields. He's continued to do the research with funding through the McNair Scholars Program, a Federal TRIO program that supports first-generation students with financial need or traditionally underrepresented students on the path to graduate school.

One of the goals of the program is to pair undergraduates with those in the working world with graduate degrees, says Haro. Fuerte works with both Tyser and an employee from the Upper Midwest Environmental Sciences Center. Both work in the area he is interested in entering — environmental management or natural resources. Studying frogs has helped him get his feet wet — both literally and figuratively.

"This is preparing me for what is to come," he says. "I know a lot of students tend to rely on lab experience. This is hands-on training."

FROG POPULATION CONTINUES TO FALL

A study released in May 2013 involving USGS scientists and other collaborators concluded that the U.S. amphibian populations examined vanished from habitats at an average rate of 3.7 percent each year. If the rate observed is representative and remains unchanged, the species would disappear from half of the habitats they currently occupy in about 20 years, according to USGS.

One person's trash

IS ANOTHER'S RESEARCH

(Editor's note: This article is by Dan Liska, a graduate student in the Microbiology Department. Upon receiving his first draft on solid waste and discussing his thesis, he wrote this article in a first-person format).

In December 2013, UW-L hosted a presentation titled "The La Crosse County Landfill: A Living Laboratory." The speaker was Hank Koch, director of the Solid Waste Department for La Crosse County.

Hank has an enthusiasm for garbage; however, he might argue that what we see as garbage he sees as an opportunity. This is a bold statement in the world of garbage, but something the landfill truly lives up to. The department is proud to have achieved Wisconsin DNR's Green Tier status by partnering with Gundersen Health System to produce electrical and heat energy from landfill gas.

Reusing waste is only one of the many programs the landfill provides. And, they encourage research partnerships with local universities. For me, I shared in Hank's enthusiasm for the opportunity in waste. I am inspired by the landfill's dedication to improve the community and environment. It can be too easy to forget about where our trash goes after taking it out to the street.

I am a graduate student in the UW-L Microbiology Department and work in Bonnie Bratina's Environmental Microbiology Laboratory. She is also interested in improving environmental sustainability.

After participating in a number of meetings with Hank and her, a partnership was developed between UW-L and the La Crosse County Landfill. My thesis is a result of this partnership. The thesis may have direct application to improving waste disposal at the landfill and protecting the environment.

Another related partnership is with the Xcel Energy Co.'s waste-to-energy facility on French Island in La Crosse. This facility provides electricity to nearly 10,000 homes by burning garbage.

The burning produces two types of ash, bottom ash and fly ash, which are sent to the landfill. The bottom ash can be used as a daily cover

material, but the fly ash has to be stored separately. This is because fly ash contains heavy metals.

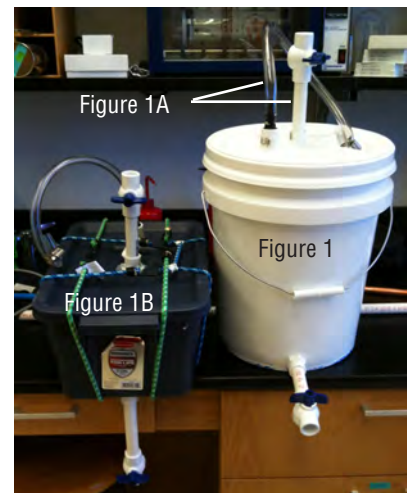
However, Xcel Energy uses a rigorous sorting process to separate materials that reduce potential hazards. The landfill could conserve space by mixing the fly ash directly with other wastes. This would be economical and could be beneficial for the microbial decomposition.

My research involves monitoring the changes in decomposition of waste when mixed with fly ash. We will use landfill simulators in our laboratory to provide a controlled environment for this study. Five-gallon buckets will be modified to make a total of 15 simulators (Figure 1). Each simulator will have an airtight lid that is fashioned with two ports, one for collecting gas and one for adding "rain" water (Figure 1A).

As water leaches through the simulators it will be collected from a third port at the base of each bucket (Figure 1B). Decomposition will then be monitored with chemical tests, gas production and microbial ecology.

Hopefully, this could allow the La Crosse County Landfill to extend future contracts with Xcel Energy without having to spend a large amount of money to build a separate fly ash storage site. If we show that there are problems associated with mixing fly ash and municipal solid waste, we can continue to separate the two and protect the environment.

The success of UW-L and the La Crosse community is partly based on involvement, agreements and partnerships. This partnership with the La Crosse County Landfill is another opportunity for UW-L to directly apply research to the benefit of the community.



PROFESSOR LEARNS FROM RESEARCH TOO

“I enjoy interacting with students doing research. Dan was interested in applied research in environmental microbiology, but was struggling to come up with a workable project when we attended Hank Koch’s seminar. His talk inspired Dan who saw a chance for a project that could serve an immediate purpose. Dan’s enthusiasm is infectious, as we’ve bounced around ideas for how to collect data and build our small-scale bioreactors. I am theoretically his mentor, but I feel like I am learning almost as much as Dan. It just goes to show that research with students can take you down some interesting and unexpected paths.”

—Bonnie Jo Bratina, Associate Professor, Microbiology Department

CLASSMATE HELPS WITH RESEARCH

“I am a junior at UW-L majoring in microbiology. I chose UW-L over other universities because of both the excellent microbiology program and ample opportunities for undergraduate research. I could not be more pleased with my decision to be in UW-L’s microbiology program. I have been greeted by an enthusiastic staff willing to help students through a challenging curriculum. In addition, my experience in the Environmental Microbiology Laboratory with Dan and Dr. Bratina has been outstanding. I am proud to be part of such great program and excited to see where my future at UW-L will take me.”

—Eric Schuh, Kaukauna, Wisconsin



Microbiology Graduate Student Dan Liska, right, at the La Crosse County Landfill with Microbiology Associate Professor Bonnie Bratina. Liska is researching the effects of fly ash in the landfill that has achieved Wisconsin DNR’s Green Tier status.



From left, Mark Sandheinrich, head of UW-L's River Studies Center, and Sean Bailey, '03, a UW-L graduate student and independent contractor for USGS, dip their nets in the waters of Shoepack Lake.

UW-L research shows decline in mercury contamination

UW-La Crosse student researchers contributed to a long-term study that shows mercury levels have decreased in waters of the Minnesota Great Lakes Region — a potential indicator that mercury pollution is on the decline.

The study was a collaboration between UW-L, the U.S. Geological Survey, the National Park Service and the National Atmospheric Deposition Program.

However, it couldn't have happened without about 35 undergraduate and graduate UW-L students who've helped collect and analyze

“Reduced mercury output is going to result in less mercury in lakes and fish,” says Professor Mark Sandheinrich. “That’s good news for humans, wildlife who consume the fish and the fish themselves.”

fish over the course of the study, says Mark Sandheinrich, head of UW-L's River Studies Center and co-author of the study.

Each year, a group of UW-L biology and chemistry students pack up their bug spray and fish nets to paddle through waters of Voyageurs National Park. They collect small perch and northern pike to analyze for mercury contamination.

Paul Drevnick, '02, was one of those students more than a decade ago. He calls the opportunity a springboard into his career. Today he is a research scientist of aquatic ecology at the University of Michigan's

biological station. His research is about understanding mercury cycling in a changing world.

As a UW-L graduate student in biology, he realized that in the future he could be working in places that appeared pristine, but were actually greatly affected by atmospheric contaminants, he says.

“I’m still doing mercury research because it’s an interesting topic and also an important topic for human health,” he notes.

Today Drevnick remains in close contact with his former UW-L mentors — Sandheinrich and Jim Wiener — who he now considers “lifelong friends and colleagues,” he says.

THE RESULTS

The report was published in the *Environmental Science and Technology* journal indicating that from 2001 to 2012 mercury in small perch from two remote lakes — Lake Ryan and Lake Peary — declined by 34.5 percent and mercury in the water of these lakes declined by 46.5 percent. The results imply that efforts to reduce mercury pollution in the U.S. and Canada are working.

“Reduced mercury output is going to result in less mercury in lakes and fish,” says Sandheinrich. “That’s good news for humans, wildlife who consume the fish and the fish themselves.”

UW-La Crosse scientists have been studying mercury in lakes and rivers of the Upper Midwest for decades, contributing to the weight of evidence that shows what a serious problem the most toxic form of mercury — methylmercury — is for fish, wildlife and humans.

UW-L faculty and staff have been to Voyageurs National Park since 2000. Jim Wiener, Wisconsin Distinguished Professor and another co-author of the study, was the first to make the trip. Today UW-L students and faculty sample interior lakes of the park. Students have the opportunity to work with cutting-edge instruments, gain field and laboratory experience, collaborate with various agencies and work on an important world problem, says Sandheinrich.

“Nationally, every state of the continental U.S. has a fish consumption advisory in one or more bodies of water,” he says. “It’s an important environmental issue.”

Sean Bailey, a UW-L graduate student and employee at USGS, worked at River Studies Center on and off for 7½ years.



UW-L researchers and a Minnesota Pollution Control Agency staff member pictured at Voyageurs National Park.

“The River Studies Center is involved with many people who are very active leaders in the field (of mercury research), including people right at the River Studies Center,” he says. “The work really relies on having a lot of people, including students to do the work.”

PE teacher ed using professional development school model



UW-L student Daniel Westbrook of Menomonee Falls, top, left, instructs students at West Salem High School.

The UW-L Physical Education Teacher Education (PETE) program has been a state and national leader in preparing physical education teachers for decades.

Faculty in PETE share the vision of being the pre-eminent national leader in the preparation of physical education teachers. To continue to advance the quality of the teacher preparation program, faculty and teacher candidates are engaging in a unique learning experience that includes spending 65-70 hours in local physical education classrooms.

Under the direction of faculty member Kristi Mally, the PETE program is preparing future physical educators who integrate their content knowledge, with an understanding of developmental characteristics in all of the learning domains, to create, organize, manage, improve, and assess learning for diverse groups of students. There is no better place for teacher candidates to learn to become effective physical educators than in a classroom with students.

During the past year Kristi Mally and Deb Sazama met with local school district personnel and physical educators to create a unique

experiential model that provides students with extended time and learning experiences in PK-12 physical education classes. The experience is providing teacher candidates with an extensive and intensive learning opportunity in partnership schools that allows them to bridge the gap between theory and practice.



West Salem middle school physical education educator Erika Olsen, left, and UW-L student Joey Frederick, right, from Wisconsin Rapids, right, collaborate to assist a student in completing an assignment on his iPad.

As part of the teacher preparation program, students enroll in Mally's Methods and Assessment of Teaching Elementary Physical Education class and Sazama's Methods and Assessment of Teaching Secondary Physical Education class, prior to their student teaching experience. Both classes are engaged in a Professional Development School (PDS) model, which involves working on-site at a partnership school with the licensed physical educator in their gym for three or more hours, each Monday and Wednesday throughout the semester.

The students in the Secondary Physical Education class arrive at their assigned school in the West Salem or Onalaska School Districts, at the same time their mentor teachers are required there, and leave to arrive back on campus for class at 11 a.m. Students in the Elementary Physical Education class begin on campus at 11 a.m. and following class, around 12:25 p.m., arrive at their respective schools in the La Crosse, Onalaska, West Salem, Holmen School districts, as well as Mt. Calvary-Grace and Coulee Christian Elementary Schools. They stay there until the end of the school day.

The PDS model is allowing teacher candidates the opportunity to implement information that is being discussed in the classroom and utilize while they are teaching at their school.

Current teacher candidate Evan Meulemans says PDS “has given me repeated opportunities to learn through experience in a real physical education class, with chances to observe, plan and teach, collaborate with one another, and seeing the importance of knowing your students inside and out. This has generated thoughts by me and ideas on how I want to teach my students, once I am officially a physical education teacher.”

The PETE faculty, teacher candidates, and current physical educators work collaboratively to plan, implement, and assess standards-based physical activities, while utilizing a variety of teaching styles and technologies that are focused on one goal, student learning.

Current West Salem High School physical educator David Neuman says having teacher candidates on-site “has been really positive because they have brought some really good activities to my class.”

Neuman’s colleague Jamie Olson agreed. “I like the new ideas that they bring to the units,” Olson says. “Their lead-up activities that we use for warm-ups have been a good change from our normal routine. They have also brought some new verbiage to teaching skills that have allowed students a different way of hearing a skill explained, and that has been very helpful.”

The PDS model also allows faculty members to teach lessons in the local schools and model best practices for both current teachers and candidates. UW-L PETE graduates are learning to communicate, motivate, and advocate lifelong physical activity for healthy living, as well as become professionals who are leaders in their communities.



by Deb Sazama,
Lecturer, Exercise
and Sport Science
Department.

ALUM FEATURED IN NCAA'S 'AFTER THE GAME'



Amy Huchthausen, '99

Former student-athlete Amy Huchthausen is profiled in the NCAA's "After the Game," a video series that celebrates the success of former student-athletes after college.

Huchthausen, '99, played softball on campus from 1998-2002. From her birth in South Korea through a Minnesota childhood and on through her college days and professional life, Huchthausen has been at the front of the pack in leadership. Her latest — she became the America East Conference's first woman commissioner in 2011.

Previously, Huchthausen worked at the NCAA office, the Atlantic Coast Conference, the Missouri Valley Conference and the Big East Conference. She says she has benefitted from being around some of the best professionals in college athletics at each stop.

Huchthausen, an exercise sport science—sports management major, was a two-time captain of the softball team on campus, a two-time All-

Wisconsin Intercollegiate Athletic Conference recipient, and exhibited early leadership skills nationally by representing peers on the NCAA III Student-Athlete Advisory Committee. The Richfield, Minnesota, native earned a degree in exercise and sport science.

Entering her fourth year at the helm of America East, she has increased TV exposure for the conference's nine schools in men's and women's basketball and lacrosse through a partnership with ESPN. She has also overseen the launch of America East's digital network, AmericaEast TV, a complete redesign of their brand platform, and a significant growth in the conference's online and social media presence.

Huchthausen has been a member of the NCAA III Management Council and currently serves on the National Association of Collegiate Women Athletics Administrators (NACWAA) Board of Directors. She is on the NCAA Leadership Council chairing the Council's Transfer Issues Subcommittee. She is also a member of the executive committee of the Collegiate Commissioners Association.

Huchthausen lives in the Boston area and is never far from a sporting event. She continues to work improve the lives of NCAA student-athletes in her conference and across the country.

See the NCAA feature at:

www.uwlathletics.com/news/2014/10/21/WTEN_1021144218.aspx

UW-L researcher featured in Time magazine

Professor provides pointers for aging men. A well-known UW-La Crosse researcher is prominently featured in Time magazine's Oct. 20, 2014 issue.

Exercise and Sport Science Professor John Porcari's recent research on how men can age-proof their muscles was highlighted in a one-page article. Muscle mass dwindles as people age, but Porcari says it can come back. The story includes sketches and pointers with six simple moves for:

- Shoulders
- Chest
- Lower Body
- Arms
- Core and Abs
- Back

The article was based from a number of American Council on Education exercise studies Porcari completed over the past several years with colleague Professor Carl Foster and their students.

Porcari, who has conducted research since coming to UW-L in 1989, is part of a team of nationally known and respected experts on exercise, fitness and performance. In 2010, he received the Award of Excellence from the American Association of Cardiovascular and Pulmonary Rehabilitation, making him one of the world's leading experts in heart and lung rehabilitation.



John Porcari, who has conducted research since coming to UW-L in 1989, is part of a team of nationally known and respected experts on exercise, fitness and performance. One of his studies was the basis of a Time magazine article in October.

More information about the article can be found at: <http://time.com/3483913/age-proof-your-muscles/>.

Competitions prepare math students

Many math problems in school involve prepackaged problems that aren't typical in the real world.

Students are asked to solve the penultimate step and arrive at an answer instead of dissecting the problem from A-Z, says Eric Eager, UW-L assistant professor of mathematics.

That's a problem for college students who will soon be solving problems in the workforce.

"Math is a deep subject where you crawl, walk, and then you get a job and are asked to run," says Eager.

That's why Eager is grateful UW-La Crosse students are able to get plenty of practice solving complex problems through mathematical modeling competitions. These

competitions challenge teams of students to clarify, analyze and find solutions to open-ended world problems. They range from ranking colleges across America to redistricting a college football conference to provide the most fair and economical competition.

In February nine UW-L math students placed in the top 10 percent of nearly 8,000 teams worldwide in a mathematical modeling contest through the Consortium for Mathematics and Its Applications.

UW-L students again came out on top during the Wisconsin Mathematical Modeling Competition last October, competing against students from UW-Stevens Point and Viterbo University.

Now UW-L math students have landed opportunities to do research at prestigious places this summer such as University of California-Berkeley, Johns Hopkins



CLICK WATCH VIDEO

ROLL OUT THE BALL

Bubble soccer in new ESS activity

The Exercise and Sport Science Department (ESS) has continued to expand movement opportunities at UW-L. A recent ESS 100 activity addition is bubble soccer.

The first bubble soccer league in the U.S. launched in Lincoln Park, Chicago, last fall. Bubble soccer has been an international activity with little or no U.S. involvement until recently. Asian countries, Australian and New Zealand, however, have been international leaders in participation and league development.

The rules of bubble soccer are simple: kick the ball in the net, but while wearing huge inflatable plastic bubbles around your upper body, meaning players can smash into each other with less chance of getting hurt. Players are routinely sent flying when the inflated bubbles collide. They, subsequently, roll and roll until their legs can find the grass or turf.

The bubble soccer balls will be used through the ESS Adventure Program as part of team building workshops within the community and in ESS 100 activity classes. Finding unique ways to motivate people to move and interact socially is the goal.

We continue to look to society to find new and exciting ways to enhance physical activity on campus.



by Jeff Steffen,
Professor, Exercise
and Sport Science
Department

nts for real-world

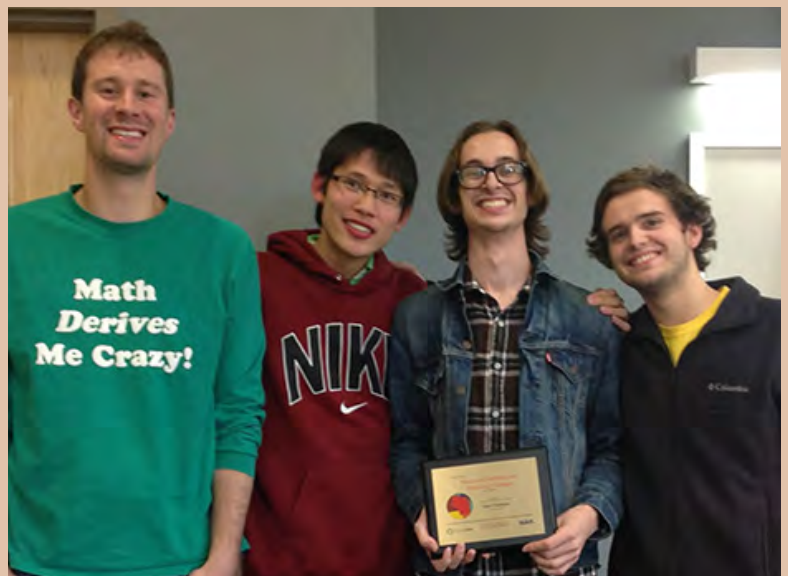
“Math is a deep subject where you crawl, walk, and then you get a job and are asked to run.”

— Eric Eager, UW-L assistant professor of mathematics.

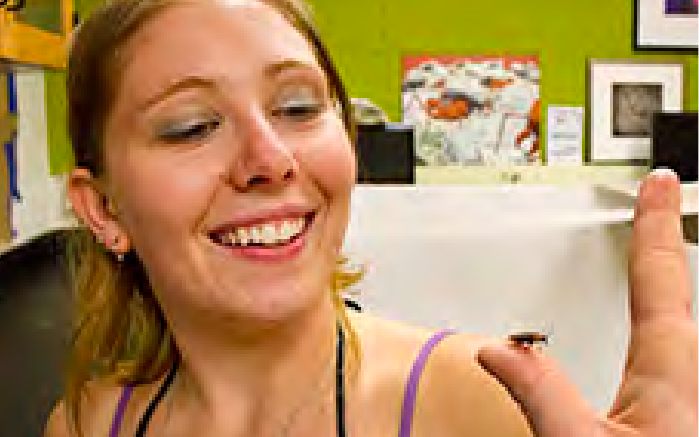
University, Cornell University and Mayo Clinic. Eager says the experiences doing real-world math outside the classroom have paid off.

“As an undergraduate student I didn’t have nearly the number of opportunities that our students have,” he says. “It’s a blessing that we have a department where the chair and dean support our students and faculty in such a large way.”

Funding from CenturyLink through the UW-L Foundation makes the Wisconsin Mathematical Modeling competition possible.



From left, Eric Eager, UW-L assistant professor of math; and UW-L students Thong Le, Mac Gallagher and Lance Hildebrand are pictured after the Wisconsin Mathematical Modeling Competition. The students also had an impressive score in the international COMAP competition.



SENIOR FACES HER FEARS, FINDS SCIENCE

Christina Burkhart, UW-L senior, pictured with one of her research subjects — a firefly.

UW-L Senior Christina Burkhart can attest that life is a lot like scientific research. It doesn't always go as planned.

Burkhart, a self-proclaimed arachnophobe, studies jumping spiders' courtship in a small corner of Cowley Hall. It's research she arrived at after she couldn't collect enough fireflies to assess their flashing and flight. When one project doesn't work out, Burkhart is quick to come up with another.

"I just think about stuff that interests me — nobody knows about everything," she says. "I've had to climb over so many walls and adapt my studies."

The 24-year-old exercises that same resilience in life.

Burkhart and her husband had their first child, a baby boy, in March 2009. Later that fall, she started the criminal justice program at Western Technical College in La Crosse. But, as a new mom, she was beginning to question her career choice in a profession that would mean an unpredictable life expectancy.

Burkhart said children weren't the only thing that made her question her career. That same fall she was experiencing strong allergy symptoms that grew worse. Eventually, her nose ran so much she had trouble breathing and all the molars on one side of her mouth were so sore that she

couldn't chew. Burkhart finally gave in and visited the doctor.

When antibiotics didn't work, doctors took a look inside Burkhart's head. She recalls sitting in the medical office, looking at the computer monitor. The doctor pointed out a golf ball-sized image directly behind her nasal cavity, explaining that it wasn't supposed to be there.

Burkhart recalls the conversation later that evening with her mother.

"When I told her 'I have a tumor in my face' — she thought I was joking," recalls Burkhart. "Two days after, it really hit me. I cried for the next two weeks."

Burkhart was presented a host of options to remove the tumor, including creating an incision directly above her front teeth or removing most of her hard palate. Luckily, doctors found a less invasive route and successfully removed Burkhart's in tumor March 2010 via her nose. Although it was non-cancerous, Burkhart said the battle changed her perspective on life.

"Kids will do that — and tumors will do that too," she notes.

Burkhart determined she wanted to live more fully. She started exercising regularly, eating healthy and listening more closely to her

body. She started listening to her dreams too. She didn't want a career she "half-way liked;" she wanted something she would love.

She graduated in May 2011 from Western Technical College and transferred to UW-L. She intended to complete a degree in Spanish, which would give her enough credits to work for the Department of Natural Resources.

She needed a "space filler" to meet one of her general education requirements and signed up for biology. Within the first week of school, Burkhart wondered why she had delayed taking the course. Studying biology reminded her of her childhood curiosity about nature and animals.

"There is so much left unknown. You can turn over a rock and another rock and continue to come up with question upon question," she says.

"Chrissy is always turning over rocks," says Biology Assistant Professor Eric Snively, one of her advisers.

Burkhart wields two desirable characteristics of a scientist: curiosity and the willingness to test and tinker, says her other adviser, Barrett Klein, an assistant professor of Biology. If she spots an organism, Burkhart will rapidly transition from posing questions to testing her questions in light of others' past research, he says.

UW-L Senior Christina Burkhart earned a summer research grant through WiscAMP. She presented her research on fireflies and spiders at the College of Science and Health Summer Celebration of Undergraduate Research poster session in July.

STATISTICAL CONSULTING CENTER CELEBRATES 10 YEARS



UW-L's Statistical Consulting Center has been in operation for 10 years. Pictured, from left, front, Sherwin Toribio, Melissa Bingham and Doug Baumann. Back, from left, Abdul Elfessi, Barb Bennie and Dave Reineke.

Abdulaziz Elfessi has provided statistical consulting services since his arrival in UW-L's Mathematics Department in 1994. Since the SCC's inception that year, the center continues to grow and now is part of UW-L's curriculum with student consultants providing valuable aid to those on campus with statistical needs. This fall the SCC is also open to off-campus clients.

The SCC's addition to the curriculum has provided students with real-life applications of what is taught in the coursework as well as additional statistical procedures not covered in classes, notes Dave Reineke. As student consultants serve clients face-to-face, they develop professional verbal and written communication skills and analyze statistical data for people. "The classroom is very much like practice and many athletes will agree that while practice can be rewarding, it doesn't match the thrill of actually getting in the game!"

Reineke attributes SCC's success to many and thanks Dean Bruce Riley, who was chair of the Mathematics Department when the SCC was developed; Provost Heidi Macpherson, whose office supports release time for the SCC directorship; and colleagues in the Mathematics Department for all of their support.

The SCC provides advice and assistance in areas of sampling, experimental design, data modeling and analysis, as well as interpretation and written communication of results for projects that require statistical methods. Under the supervision of Mathematics Department faculty members, statistics majors and students with actuarial science concentrations provide statistical consulting to those in need on or off campus.

To find out more or to set up an appointment visit www2.uwlax.edu/Mathematics.



In her lab, she has tubes filled with spiders. She studies how their size, color, movements and dancing might help them find a mate. Her fear of them is one of the main reasons she is working with them.

"I think it's healthy to face your fears — to learn why you are afraid," she says. "Constantly worrying about where you go because of something like a spider, puts limits on your life."

Burkhart intends to complete her undergraduate degree in biology in May 2015 and apply to the master's biology program at UW-L for fall 2015. She now has two children and looks to have a third right before she starts her master's.

One day she'd like to earn a doctoral degree. She anticipates more obstacles on that path such as a potentially long daily commute to Madison and caring for her children while in

a rigorous program. But she plans to keep on looking for ways around those obstacles.

"I guess I'd call it determination in the face of failure. I think I had that quality before, but I think I have it more now," she says. "What I see more often than not is people complaining that the world isn't fair instead of finding a way to fix it. Why not start small — with yourself."

UW-L FACULTY AND STAFF LEAD MIDDLE SCHOOL SCIENCE CAMPS

UW-L held its 15th annual Girls in Science weekend and its fourth Boys Science Exploration Camp June 21-22, 2014.

The programs bring middle school students to campus for hands-on academic exploration, collaboration with other young people with similar interests and a chance to increase their knowledge and talent in science and mathematics.

The two programs are a joint effort between the College of Science and Health and Continuing Education and Extension. The program is directed by Susan Kelly, Mathematics; and Karen DeSchepper and Angie Coenen, Continuing Education.

The two camps run separately, but are on the same weekend to conserve costs, increase the availability of faculty and staff and make it easier for potential families wishing to participate in both programs.

Saturday afternoon students moved into the residence hall and then went to Cowley Hall for a student and parent welcome. Then, UW-L faculty and academic staff with college teaching assistants taught two, two-hour workshops.

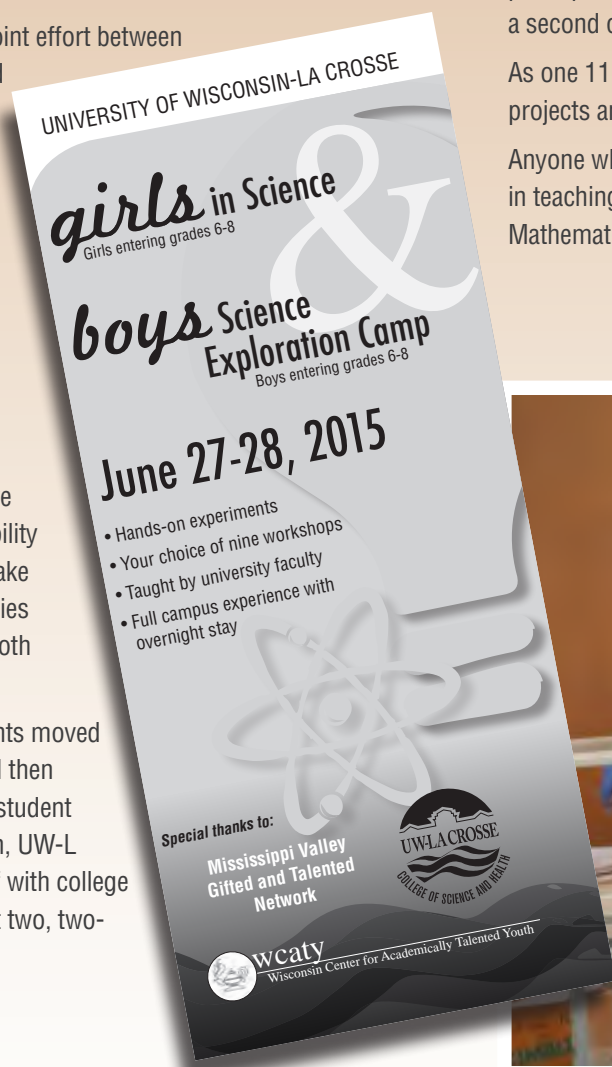
After four hours of science and mathematics, girls and boys were hungry and ready for some food and relaxation. After dinner they had an evening of fun with college students and recent alumni working as resident assistants.

On Sunday, kids participated in one more hands-on workshop, a pizza lunch and participated in a large physics show for each group.

Each year the program receives positive assessments from participants and parents, and often students return to the program for a second or third year.

As one 11 year-old girl put it, "I LOVED the whole thing — all the projects and experiments!"

Anyone who teaches in the sciences who would be interested in teaching for these two programs can contact Susan Kelly, Mathematics, at skelly@uwlax.edu.



Students investigate light and matter in Kendric Nelson's chemistry workshop.



UW-L faculty member Tanya Cordes assists a student using chemistry to create lip gloss as part of the workshop, “Lovely Lips Laboratory.”



THIS YEAR'S WORKSHOPS INCLUDED:

- Physics in Action**, Seth King, **Physics**
- Light Bright!**, Jennifer Docktor, **Physics**, and Megan Litster, **Biology**
- Crime Scene Investigation**, Faye Ellis, **Biology**
- Hunter's Road Kill Café**, Andrea Peirce, **Microbiology**
- Lovely Lips Laboratory**, Tanya Cordes, **Chemistry**
- Mathematics in Graphs — It's Cool!**, Huiya Yan, **Mathematics**
- Movie Production through Computer Programming**, Andrew Berns, **Computer Science**
- Mrs. Jones's Kidney Problem**, Marisa Barbknecht, **Microbiology**
- Shards of the Past: Experimental Archaeology**, Connie Arzigian, **Archaeology**
- Simulating Rover Missions on Mars with Lego Mindstorms**, Josh Hertel, **Mathematics**
- When Light and Matter Collide, There's Chemistry!**, Kendric Nelson, **Chemistry**
- Zombies and Math: Will the Zombies Win?**, Robert Allen, **Mathematics**

STUDENT TEACHING ASSISTANTS INVOLVED THIS YEAR:

Megan Schullo, John Gallagher, Elizabeth Leighton, Dustin Stevens, Jason Boll, Brianna Lyke, Katy Gallenberg, Casey Hintz, Erik Anderson, Rebecca Polanski, Jenna Malinauskas, Megan Wimmer, Morgan Herried, Sydney Lomnes, Joseph Krueger, Taylor Bailey, Zach Swanson, Joseph Grant and Katie Mulera; Resident Assistants were Paige Baxter, Bryan Krueger, Caitlin Hinytzke (former Girls in Science student), Becky Lemminger, Jacob Peterson, Kyle Vara and Rachel Weier.

THE IMPORTANCE OF RESIDENT ASSISTANTS

Kelly sends a special thanks to the resident assistants. Some have worked in the camps for several years and their time and energy in the program adds to the students' experience.

HELP BUILD UW-L MIDDLE SCHOOL SCIENCE CAMPS

If an individual or corporation would be interested in helping lower the tuition cost or to help with need-based scholarships for the program, one-time donation or annual support, it would be greatly appreciated. If interested, contact Continuing Education and Extension or Susan Kelly at skelly@uwlax.edu.

Biology + Math =



James Pierce, associate professor of Mathematics, center, works collaboratively with students from the Mathematics and Biology departments.

In 2012, faculty members primarily from UW-L's Biology and Mathematics departments began to meet weekly as a way of fostering research collaborations between the two.

Initial meetings consisted of seminar-like talks on each of the participants' research programs, with the intention of shedding light on the possible intersections of the research programs.

Since then, the group has grown and now includes undergraduate students from Biology, Computer Science and Mathematics; faculty members from the Computer Science Department; faculty from Viterbo University; and researchers from the U.S. Geological Survey (USGS), as well as visiting scientists from around the country.

Meetings encompass a broad range of formats from research-based presentations by one or more participants to breakout sessions in which participants work together to develop and implement collaborative projects and curriculum redesign materials. Interactions are strengthened by the diversity of the contributing voices and perspectives.

The collaborations over two years have led to five grant applications, 20 presentations at regional and national conferences, two publications and four papers accepted for publication. The interactions also served as the nucleus for initiating and hosting the first Midwest Mathematical Biology Conference in May 2014, and for developing a Mathematical-Biology minor at UW-L.

Together, the interactions and projects emerging from the Math-Bio Working Group have resulted in more collaborative environment within the university, and outside of the institution as well.

Research



Assistant Professor of Math Eric Eager headed to the woods during research of American chestnut populations in West Salem by UW-L biologists.



by James Peirce,
Associate Professor,
Mathematics
Department

HERE ARE A FEW OF THE GROUP'S CURRENT RESEARCH PROJECTS:

- *Modeling and Analysis of Fungus-Infected American Chestnut Populations using Population-Level (Matrix) and Individual-Based (Computational) Models*; Marty Allen (Computer Science), Anita Davelos Baines (Biology), Eric Eager (Mathematics).
- *Outbreak of Waterfowl Disease in the Upper Mississippi River*; Barb Bennie (Mathematics), Roger Haro (Biology), Mary O'Driscoll (Mathematics - Undergraduate), James Peirce (Mathematics), Greg Sandland (Biology).
- *Using Boolean Network and Hidden Markov Models to Study Gene Regulation and Genomics Problems in the Classroom*; Marty Allen (Computer Science), Eric Eager (Mathematics), Roger Haro (Biology), Sheldon Lee (Mathematics - Viterbo University), James Peirce (Mathematics).
- *The Scholarship of Teaching and Learning: Flipped-Classroom Approach to Teach a Sophomore-Level Mathematical Biology Course*; Patrick Barlow (CATL), Eric Eager (Mathematics), James Peirce (Mathematics).
- *Using Branching Process and Individual-Based Models to Study Populations Subject to Multiple Extinction Stressors Stemming from an Increase in Wind Energy Development*; Eric Eager (Mathematics), Richard Erickson (Biology - USGS), Jessica Stanton (Biology - USGS), Wayne Thogmartin (Biology - USGS).
- *Common Filter-Feeding Caddis Fly Larvae Breakdown Large Wood Debris in the Upper Mississippi River: Modeling and Analysis using Partial Differential Equations and Methods of Inverse Theory*; Eric Eager (Mathematics), Roger Haro (Biology).

For more information, visit

<https://sites.google.com/a/uwlax.edu/eric-eager/service/university-of-wisconsin---la-crosse-math-bio-working-group>



UW-L Entomologist learns more about bee sleep

Entomologist Barrett Klein is an assistant professor of biology at UW-La Crosse.

We've all heard the phrase "busy as a bee," but not many have considered what bees do when they sleep.

UW-La Crosse Entomologist Barrett Klein is looking deep into the sleep patterns of bees to better understand what sleep might mean for all species — including humans. His research was published in July in the scientific journal PLOS ONE. It offers the first detailed spatial analysis of sleep ever conducted on an invertebrate society.

"Few have examined sleep in the context of a society," explains Klein. "I am interested in how this mysterious and seemingly ubiquitous animal behavior operates and functions within a social group of organisms."

Inside the honeybee nest, factors like temperature and position from resources may affect sleep, notes Klein. Worker bees, which are all female, are divided into castes — each caste performing a different task. He and his colleagues found bees of different worker castes slept in different areas of the nest relative to position of the brood and surrounding temperature. Older worker bees generally slept outside cells, closer to the perimeter of the nest, in colder regions, and away from uncapped brood. Younger worker bees generally slept inside cells and closer to the center of the nest, and spent more time asleep than awake when surrounded by uncapped brood.

Also, the average surface temperature of sleeping foragers was lower than the surface temperature of their surroundings, offering a possible indicator of sleep for this caste. In the paper, Klein and his colleagues propose mechanisms that could generate sleep patterns

for specific groups within the nest and discuss functional significance of these patterns.

Their work creates a foundation for investigating functional benefits of sleep that vary with task performed. It's a topic particularly interesting in honey bees because the workers change tasks as they age, so individuals can be examined as they age and change tasks.

In addition, Klein's research could lend insight into the best sleep patterns for social organisms faced with around-the-clock needs.

Klein, an assistant professor of biology at UW-L, has been studying honey bees since 2005. In addition to his recent publication, he published a paper in Proceedings of the National Academy of Sciences (PNAS). The paper examined a functional consequence of sleep loss in honey bees with respect to their ability to precisely communicate direction information when advertising the location of a food source to their siblings.



UW-L student's research aims to stop invasive species

Amber Miller recalls the day she learned her despise of invasive species.

She was an intern lugging a chainsaw and herbicide up a bluff to cut down honeysuckle and buckthorn with the Mississippi Valley Conservancy. Simply cutting the pesky plants wasn't enough. They would re-sprout with vengeance.

"And then I learned you can go out and buy honeysuckle at the nursery," she says. "Sadly, my mother lost her honeysuckle bush after that."

Today Miller, a UW-L graduate student in biology, continues her fight with invasive species. But she's adding a bit of brains to her brawn.

Miller received a National Science Foundation Graduate Research Fellowship to develop a strategy to restore ecosystems dominated by invasive species. She will receive a three-year stipend, plus tuition and fees.

"This is an extremely competitive program," says Meredith Thomsen, associate professor of biology. "The students chosen for this award are regarded as showing great potential as science professionals."

Miller's fellowship starts this summer. She is already at work on Goose Island where an invasive species — reed canarygrass — has taken over the floodplain forest. She wants to

provide land managers a system to restore the natural ecosystem effectively at the lowest possible cost. And she aims to find a strategy applicable to all invaded ecosystems.

"Invasive species are a problem everywhere, and they will continue to be a problem," says Miller. "It's fascinating to me to think about how to work around these plants."

Miller aims to get rid of invasive species by applying a theory called applied nucleation. It involves removing the invasive plant and establishing small sections of native trees in its place. In theory, once these islands of trees are established to grow on their own, they can become a natural haven for other native flora and fauna to take root and spread.

She is hopeful applied nucleation will work at Goose Island and could be applied to other invasive species.

Eliminating invasive species will mean more than improving the landscape. It can also improve the overall health of ecosystems and the U.S. economy. Invasive species cost the U.S. billions of dollars in damages every year. Spreading of invasive plants and animals negatively affects property values, agricultural productivity, public utility operations, native fisheries, tourism and outdoor recreation, according to the U.S. Fish and Wildlife Service.

Specifically, Miller's research is helping with the U.S. Army Corps of Engineers' mission of environmental stewardship of roughly 25,000 acres of floodplain forest the corps manages on behalf of the public, says Randy Urich, environmental sections manager for the U.S. Army Corps of Engineers.

Reed canarygrass has the potential to convert forested habitat managed by the corps into grassland — outcompeting other plants, and replacing native habitats important to wildlife.

Goose Island is especially important for birds that use the floodplain forest as their migratory flyway.

"What Amber is doing is really helping us to narrow down the management choices and find those that would be most successful in restoring habitats," he says.

McNair Scholars Program and First Year Research Experience students from UW-L will be helping Miller in the field. Both programs aim to increase the participation of underrepresented groups in the sciences (FYRE) and in academia more generally (McNair.)

"Providing that experience as soon as possible is only going to help grow the scientific community," says Miller.

Miller's research is in collaboration with the U.S. Army Corps of Engineers and the Upper Midwest Environmental Science Center.



UW-L graduate student Amber Miller took her first trip out to Goose Island to plot out her planting in mid-March. Her work through a highly-competitive National Science Foundation Grant will contribute to knowledge about how to improve the environmental quality of the region, and beyond.



Researchers in rex Lab explore how dinosaurs once moved

Oberon, the great horned owl, helped researchers in UW-L's rex Lab figure out how dinosaurs once moved. Researchers observed how he eats. Oberon lives at the Calgary Wildlife Rehabilitation Society.

Humans outgrow their baby teeth, snakes outgrow their skins, crabs outgrow their shells, and now, explains Eric Snivley, UW-L professor of Biology, we are almost certain that juvenile carnivorous dinosaurs had feathers that some outgrew.

"It ruins the perception you had as a kid," says Lauren Schultz, a student researcher in Snivley's lab. "You put feathers on them and they are just not scary anymore. They look like these huge chickens. It's ridiculous. It makes it real."

Snivley and his team of student researchers in UW-L's rex Lab are uncovering more about what dinosaurs were really like.

But instead of studying dinosaur plumage, they aim to uncover more details about dinosaur feeding patterns. The key to their research is bone density, and in the case of feeding pattern, skull density.

Schultz uses software for CT scanners like those used for medical diagnostics to determine dinosaur skull density. The CT scanners create a series of cross-section images of the bone that Schultz then coalesces into a 3D model. The result is an image with Rorschach-meets-Doppler radar coloration.

"I've gotten a lot better at reading CTs," says Schultz, pointing to a red region that indicates high density on a model of a crocodile skull she made.

Oberon, the great horned owl, helped researchers in UW-L's rex Lab figure out how dinosaurs once moved. Researchers observed



UW-L student researcher Kari Mosbacher at the National Eagle Center with a bald eagle. Birds are used to help students and staff in UW-L's rex Lab understand how dinosaurs moved.

how he eats. Oberon lives at the Calgary Wildlife Rehabilitation Society.

Schultz makes these models for dinosaurs and their modern-day relatives, namely birds and reptiles, and compares them. With knowledge of how birds and reptiles move and behave, she can hypothesize about how a dinosaur once moved. This process involves volleying ideas with Snively and her labmates and helps her hone scientific inquiry skills.

“Lots of students come up with better hypotheses than professors who are often focused on only one aspect of a problem,” says Snively.

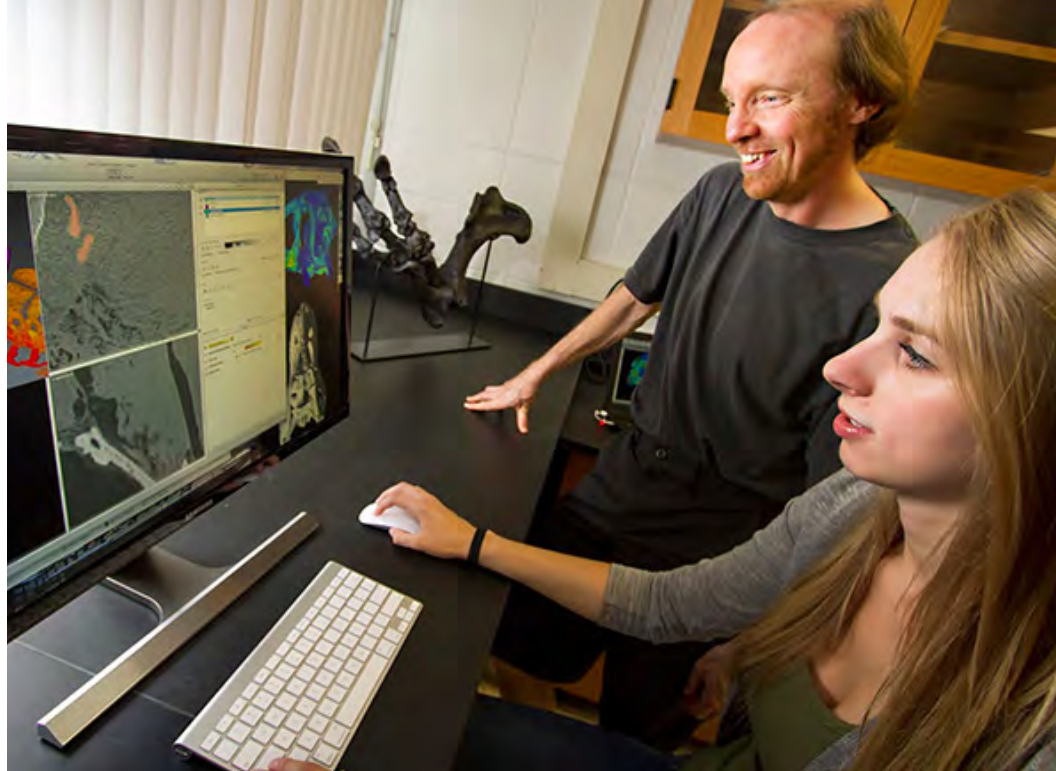
Students then test these hypotheses with state-of-the-art engineering software that puts the models in motion — a “stress test”. By doing so, students can see how much stress particular dinosaur movements, like tearing flesh from prey, put on specific parts of the bones. If a particular motion results in less stress on the dinosaur bone than would be expected for other similar-sized animals, the researchers can infer that the dinosaur evolved a bone structure optimized for that particular motion.

These movement analyses are cutting-edge; Snively’s lab is one of the only groups in the country doing them, which gives students an unparalleled opportunity to do pioneering research.

And what are these pioneers discovering? The seminal research in Snively’s lab is helping to reshape understanding of dinosaur biomechanics. It turns out T. rex was evolutionarily optimized for striking, crushing and tearing.

“T. rex wins all the time.” Snively says with a grin.

T. rex was a juggernaut with a powerful neck and jaws. It could strike its prey like a pigeon pecking at grain on the sidewalk, chomp down, tear flesh like a crocodile thrashing its



UW-L student Lauren Schultz is a biology major and a pre-med, chemistry and Spanish minor. Here she is comparing dinosaur and crocodile skull models with paleontologist Eric Snively.

head from side to side, and escape without having to grapple. This proposed feeding pattern obviates muscular forelimbs for holding down prey and explains the iconic dinky arms of T.rex.

This proposed feeding pattern has also helped differentiate the T. rex eating style from that of carnivorous T. rex predecessors, such as the Allosaurus. Until recently, bones alone have provided insufficient information for scientists to compare dinosaur eating behaviors in detail. Upon employing cutting-edge biomechanical analysis software, however, Snively and colleagues have elucidated that the Allosaurus actually wrenched at its prey much more daintily than T. rex. T. rex fed like a red-tailed hawk or a golden eagle, using its legs minimally and relying mainly on its brawny neck muscles to tear its prey. Allosaurus, on the other hand, had fed more like the American Kestrel in the video below. It pecked at its prey with a scooping motion that allowed it to latch on to its prey and then pulled up with its legs to tear.

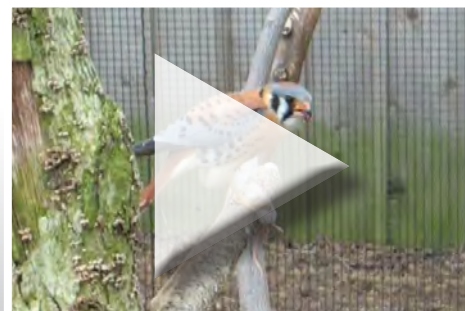
Sure, delving into the lives of dinosaurs is intriguing, but Snively’s lab offers more

than that. It adds to the evolutionary picture of the success of animals on Earth. It also provides students with opportunities to hone skills applicable to science and health-related careers.

For Schultz, it shifted her notion of T. rex — ferocious, yet feathered. But, more importantly, it sparked an open-minded curiosity that is fundamental to scientific research.

“I mean, I might think my hypothesis is right,” Schultz reflects, “But when I hear [her labmate’s] hypotheses, I have to look at things from a different perspective.”

UW-L University Relations Specialist Kjerstin Lang contributed to this report.



CLICK WATCH VIDEO



Microbiology says goodbye to two, long-term leaders

Microbiology Professors from left, Mike Winfrey and S.N. Rajagopal will retire at the end of the academic year. They have a combined 61 years working for the department and building it into the strong program it is today.

A few years ago, UW-L student Amy Baker was accidentally placed in Microbiology 100. It wasn't the course the education major had selected.

"I was so angry and confused — thinking I don't even know what this means — microbiology — what are you talking about?," she recalls.

But the mishap ended up in Baker changing her major to microbiology.

Today the UW-L senior plans to continue on in UW-L's microbiology graduate school program. The reason she dramatically changed her plans?

"Without a doubt — the faculty in the department. There is so much passion

here," she says. "They really care about their students."

This spring, two of those faculty members will retire after a combined 61 years working for the department. Both Mike Winfrey and S.N. Rajagopal have been the primary forces in building the microbiology department. Winfrey was the program's director in 1997 and became the first chair of the microbiology department when it split off from biology in 1999. Rajagopal is the department's food and industrial microbiologist, an area where most of the department's students find careers.

S.N. RAJAGOPAL: THE FOOD MICROBIOLOGIST

Rajagopal started at UW-L 28 years ago to develop Food and Industrial Microbiology within the program.

One of his most significant achievements was the start of the Symposium on Industrial and Fermentation Microbiology 18 years ago. The symposium allows students to connect with people practicing industrial and fermentation microbiology in industry from all over the world, such as biofuels, dairy, antibiotics, bread, beer, waste treatment, water purification and more.

"He (Rajagopal) has provided essential breadth to our department, has a connection with industry and gotten a lot of our students jobs," says Bonnie Jo Bratina, associate professor of microbiology.

Very few universities have programs similar to UW-L where the students get first-hand exposure to industrial fermentation concepts, says Chris Stowers, with Dow AgroSciences, part of The Dow Chemical Company.

Stowers was among the speakers at the April 25 symposium. He traveled from Indianapolis because it was an opportunity to network with academia and other experts.

“It (academia) is typically working on the cutting-edge, high-risk technology,” says Stowers. “It’s important for me, in industry, to keep a tab on that.”

He also finds it a great way to network with potential future employees.

“It is clear students wanted to be here,” says Stowers. “They are very engaged. It can be hard to find students enthusiastic about this particular field.”

Bob Schwartz, from Chicago, started attending the symposium before it was a formal gathering. He continues to return because he likes sharing his career in dairy fermentation with students. “I was trying to communicate the fun in my career and that you can be successful in areas of industrial fermentation,” says Schwartz, who is now retired.

Pam Benzing, lab manager in microbiology at UW-L, says Rajagopal has put extraordinary effort into finding great speakers who make the symposium an event everyone wants to attend.

Baker and UW-L Senior Margaux Huismann — who changed her major from pre-nursing to microbiology — say the symposium has shown them how much they’ve learned. When they started in the program, they attended many scientific talks that they didn’t comprehend.

“The thing about today,” explains Huismann, “I knew everything they were talking about and I wasn’t confused once.”

Speakers touched on concepts she and Baker already knew from organic chemistry, bacterial physiology, biochemistry and food microbiology.

“It makes you realize all that you are learning,” says Baker.

Benzing, who was also a student in the microbiology graduate school program in the late 1990s, says Rajagopal expects a lot from his students, but offers them a lot in return.

“He is our biggest cheerleader,” says Huismann. “He says we are more qualified than we think we are because the microbiology program here is one of the best.”

After UW-L, Rajagopal plans to work for a cheese company and do research on bacterial cultures used in cheese making.

MIKE WINFREY: UW-L’S MICROBIOLOGY BEGINNING

Mike Winfrey was hired in 1981 to help expand the microbiology program at UW-L. At that time, he was one of three microbiologists and Microbiology was a concentration in the biology major.

Winfrey was hired to teach advanced bacteriology, but subsequently divided this course into bacterial physiology and microbial genetics and developed new courses in bacterial diversity and aquatic microbial ecology.

Winfrey became the microbiology program director in 1997 and was the first chair when the Department of Microbiology was formed in 1999.

“He did a lot to guide us through the baby steps of becoming a department,” notes Bratina.

He was also an early and significant contributor to UW-L mercury research starting in the 1980s, long before the mercury toxicity problem was well documented. Today UW-L mercury research has expanded from nearby rivers to bodies of water across the United States and involves international collaborations.

Winfrey and his graduate students found that the mercury-methylating activity of bacteria in bottom sediments greatly affected the concentrations of methylmercury

accumulating in aquatic food webs and fish, says Jim Wiener, Wisconsin Distinguished Professor, in UW-L’s River Studies Center.

“Their published papers from those landmark studies continue to be widely cited more than two decades later,” he says.

An article by Winfrey and his Canadian coauthor John Rudd was published in one of the world’s leading environmental science journals, “Environmental Toxicology and Chemistry.” The article, which reviewed years of mercury research as well as new findings, was ranked No. 24 on the Top 100 list of the most highly-cited environmental impact papers in the journal’s 30-year history.

In 1991 Winfrey, along with faculty Al Wortman and Marc Rott, began offering National Science Foundation funded summer laboratory workshops in molecular biology for college faculty from across the U.S. and Puerto Rico. The lab exercises were based on the exercises developed for the microbial genetics course. Over five years 100 faculty were trained in modern molecular biology techniques.

The course was so popular that Winfrey, Wortman, and Rott published the exercises in a molecular biology laboratory manual. It is now one of the most popular molecular biology laboratory manuals in the U.S.

Bratina was hired “to be another Mike Winfrey,” she jokes, noting she is also an environmental microbiologist.

“I came in here thinking I knew physiology, but, after sitting through his lab, I learned a lot more physiology from him,” she says. “He has been an amazing mentor.”

Winfrey makes topics as complex as bacterial physiology comprehensible and sometimes even humorous, his students say. He does demonstrations a lot, they note, recalling one where he threw a marker into the classroom from outside the door to demonstrate proton gradients.

“He lightens the mood — right when you least expect it,” says Baker.

First state distinguished professor on campus retires

JIM WIENER HERE SINCE 2001

Jim Wiener had a stellar 36-year career mentoring young scientists and students.

He also investigated the influence of human stressors on the ecology of lakes and streams. UW-L's first Wisconsin distinguished professor has retired.

The internationally renowned scientist joined the River Studies Center in the College of Science and Health in January 2001. He arrived on campus after holding scientific and leadership positions with the Oak Ridge National Laboratory, the U.S. Fish and Wildlife Service, the National Biological Service, and the U.S. Geological Survey.

At UW-L, Wiener provided leadership in planning, funding, and conducting scientific investigations required for science-based management of regional and national freshwater resources. He received \$2.6 million in external grants and contracts for the university while here.

In addition, more than 50 undergraduate and graduate students received substantial experience through hands-on participation in field and laboratory research projects. Since 2008, Wiener has led a team of faculty and students in working with the National Park Service to assess mercury contamination of aquatic food webs and fish in six national parks in the western Great Lakes region.

"Without doubt, Jim is the best scientist and among the finest of colleagues I've had the pleasure of working with at UW-L over the past 25 years," says Mark Sandheinrich, director of the River Studies Center. "He is one of those rare individuals who is truly selfless in creating opportunities for other faculty and students."

Sandheinrich says the admiration and respect Wiener has earned in the scientific community is unparalleled. "Because of Jim and the distinguished professorship, the scholarship and research productivity of aquatic science faculty in the River Studies Center is at a level that would not be normally possible with the teaching



Jim Wiener, UW-L's first Wisconsin distinguished professor, has retired.

load typical of faculty at a comprehensive university," Sandheinrich notes. "He has increased national and international awareness of UW-L's capabilities and research in the scientific, management, and policy arenas."

Scientific information generated by center's faculty and students has been highlighted in technical briefings to the U.S. Congress, U.S. Environmental Protection Agency, the White House Office of Science, Technology and Policy, and the European Union, says Sandheinrich, "We'll miss Jim and are grateful for his friendship and commitment to excellence that he has maintained at UW-L for the past 14 years," he says.

The Wisconsin distinguished professorship was financially supported by the UW System, UW-L and UW-L Foundation with generous corporate and private donors.



by Mark Sandheinrich,
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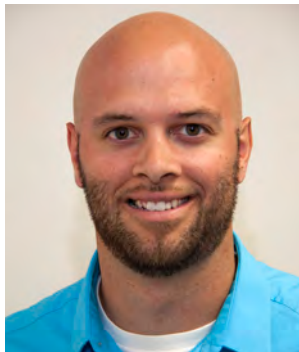


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UW-L'S MARK GIBSON ADDED TO *hall of fame*



A UW-La Crosse department chair has been honored by a national professional organization.

Mark Gibson, chair of the Exercise and Sport Science Department, has been inducted into the National Athletic Trainers' Association Hall of Fame. Gibson was recognized with five others at the NATA 65th Clinical Symposia & Athletic Trainer Expo in Indianapolis on June 27.

The NATA Hall of Fame is the highest honor an athletic trainer can receive. Honorees are recognized for significant, lasting contributions that enhance the quality of health care provided by athletic trainers and advance the profession. Since inducting its first class in 1962, the Hall of Fame now has 288 members.

Gibson, also director of the university's athletic training program, previously served as the head athletic trainer at UW-L. Before coming to campus in 1985, he held positions at Slippery Rock University,

Southern Arkansas University and Southern Illinois University. Gibson has dedicated his career to the profession serving as an athletic trainer, educator, frequently published researcher, academic adviser, site visitor, consultant and expert witness. He has taught athletic training internationally and is coordinating efforts to develop the profession in the European Union.

Gibson is currently chair of the NATA International Committee. He previously served on the NATA board of directors and was president of the Great Lakes Athletic Trainers' Association. He has been inducted into the Wisconsin Athletic Trainers' Association Hall of Fame and recognized by GLATA and NATA for his years of service. He was also the recipient of the NATA Most Distinguished Athletic Trainer Award.

Gibson earned a bachelor of science degree from Slippery Rock University and master of science degrees from Southern Illinois University (Carbondale) and the University of Indianapolis.

Other inductees into the Hall of Fame this year included:

Jon Almquist, a concussion specialist with Fairfax Family Practice Comprehensive Concussion Center in Fairfax, Virginia.

David O. Draper, a professor in the department of Exercise Sciences in the College of Life Sciences at Brigham Young University.

Katie Grove, an educator and practitioner for nearly 40 years. She has directed the undergraduate athletic training curriculum at Indiana University at Bloomington for more than 20 years, 17 of which she also served as an assistant athletic trainer.

Paula Sammarone Turocy, an associate professor in the John G. Rangos School of Health Sciences and the director of the Pre-Medical and Health Professions Programs at Duquesne University in Pittsburgh.

Ken Wright, a professor and director of the sports management program at the University of Alabama.

For more about the NATA visit www.nata.org.

Brazilians studying science, more at UW-L



Livia de Oliveira Souza, left, is from Federal University of Minas Gerais, in Minas Gerais, Brazil and Bruna Boff, right, is from Feevale, a university in Rio Grande do Sul, Brazil. They watched the World Cup while at UW-La Crosse, including Brazil's recent 7-1 loss to Germany. "Everyone was surprised," says Boff. "We knew that it would be hard, but not this way! It was ridiculous."

Cold weather and daily homework assignments are big adjustments for Brazilian students who arrived at UW-La Crosse last spring.

Through the Brazil Scientific Mobility Program, Bruna Boff and Livia de Oliveira Souza are studying at UW-L with 13 other Brazilian students. The program is part of the Brazilian government's effort to grant 100,000 scholarships to the best students from the South American country to study abroad at the world's top universities. The

program aims to widen the academic and research exchange between the U.S. and Brazil.

At UW-L, the Brazilians are learning English and studying in Science, Technology, Engineering and Mathematics fields. They will return home with a U.S. university on their resume — a notable achievement, they agree. United States universities and research happening there, have a strong reputation in other parts of the world, notes de Oliveira Souza. "It's like a dream for me to live and study here," she adds.

Boff and de Oliveira Souza are in English as a Second Language classes this summer and first semester biomedical science classes. They say UW-L offers science courses — like "Biology of Cancer" — not offered back home. Adjusting to the large amount of work outside of class at UW-L has been challenging and rewarding, they say.

"I think I will learn many things I couldn't learn in Brazil," says Boff.

Outside the classroom they are learning skills too. It is typical in Brazil, they say, for students to attend a higher education institution near home. At UW-L they've had to adapt to living independently and in a new culture. Yet, they've learned to build relationships on UW-L's international campus that welcomes students from more than 40 countries. And they are learning more about their home country. The 15 students come from different parts of Brazil, each with different cultures and accents.

The two have been impressed with UW-L resources. The library, residence halls, Recreational Eagle Center and classrooms with state-of-the-art technology improve the experience, they say.

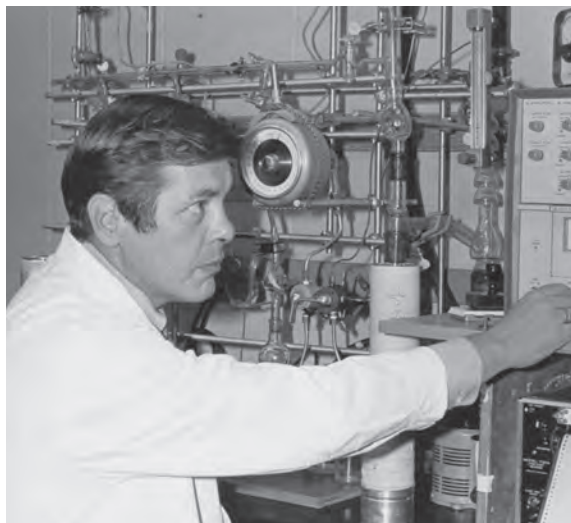
They've also enjoyed life off campus.

"I really like La Crosse, the city, because it's small," says Boff. "The people are friendly and are always ready to help us."

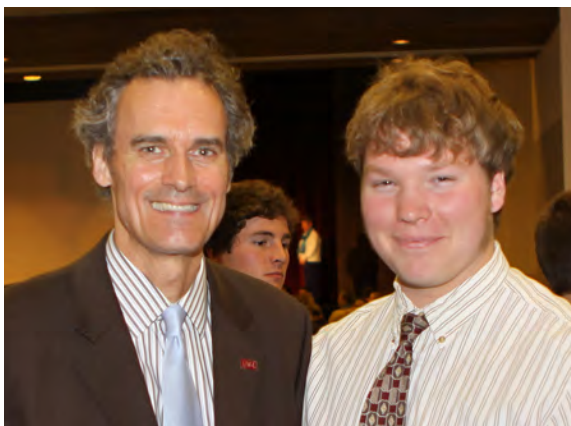
The two will leave in August 2015 after 18 months. With their academic studies complete, they plan to pursue internships in summer 2015 in the U.S. before returning home.

PROFESSOR LEAVES A LASTING BOND

Scholarship honors long-time Chem Prof Larry Nutter



Chemistry Professor Larry Nutter in his lab in Cowley Hall.



Chancellor Joe Gow with Nutter Scholarship recipient Caleb Wagner.



College of Science and Health alumni who remember Professor Larry Nutter recall him as being humble. Others he met would find that out too.

When people asked him what his profession was, he replied, “a teacher.” Those meeting Nutter wouldn’t know he was a pillar in UW-L’s prestigious Chemistry Department. Nutter’s wife, Edie, wants to change that.

Edie first worked to recognize him by funding scholarships to chemistry students since he died in 2003. She’s met all those recipients — one even reminded her of Larry.

Now Edie is sustaining on her husband’s legacy. She has established the Larry & Edith Nutter Chemistry Scholarship Endowment Fund to give deserving UW-L chemistry students scholarships annually. And, she’s made arrangements for an estate gift.

“He thought there was nothing more beautiful than a mind that succeeds with education,” says Edie. “I thought it was the best way to honor Larry. Teaching was everything to him.”

Nutter moved with his family to La Crosse from Menomonie in 8th grade. He graduated from Central High School in 1949 and UW-L in 1954. After serving in the US Army for two years in Germany, he returned with a German native — Edie, who became his bride.

Following a year teaching in Cashton, he returned to Central, where he had the distinction of preparing three students accepted into West Point. He earned master’s degrees at UW-Madison in 1961 and Marquette University in 1965. He did doctorate studies at the University of North Dakota.

In 1963, UW-L Chemistry Professor Milford Cowley persuaded him to return to his alma mater. Nutter stayed in the department until retiring in 1996. “He never missed a day — not a day,” recalls Edie. “He was a man who was devoted to education.”

Nutter “worked for everything he earned,” says Edie. That’s why she wants to help students. “He thought education was a gift,” she explains. In his honor, she has one request of scholarship recipients: “To do a good deed for someone they don’t know.”

It’s a lasting bond the late Chemistry Professor Larry Nutter continues to give.

Help honor Nutter — or professors like him — who had an impact on you. Visit <http://foundation.uwlax.edu>