

# Student Spotlight

## SARA ALESI

M.S. student  
Civil and Environmental Engineering

Since August 2016, I have been an intern with Plumley Engineering in Baldwinsville, N.Y. Plumley provides environmental, civil, and geotechnical services across Central New York. So far, I have sampled groundwater for contaminants, gathered data and information for project proposals, visited clients' sites, and observed remediation projects, such as replacing a leaking gasoline tank at a gas station. Every Tuesday and Thursday, I usually traveled to a project site (typically a gas station, industrial building, or landfill) and sampled the groundwater. Groundwater sampling is a several step process: I purged the monitoring well of the existing water, waited for the well to recharge with groundwater, and then collected a sample to send to the lab for analysis. Sampling these monitoring wells regularly allows environmental engineers to track the progress of the remediation and is a very useful skill in consulting that I can now add to my resume!

Before attending Syracuse University, I worked as an environmental chemist, analyzing soil and water samples for a variety of pollutants. While I enjoyed working in a laboratory, I realized that I would find it more fulfilling to work on a project from start to finish, and to see the results firsthand. This led to my interest in environmental engineering and brought me to SU's Department of Civil and Environmental Engineering for graduate school.



Steve Sartori

EMPOWER helped prepare me for non-academic career paths through the Career Pathway Experience – I have formed invaluable connections, not only with my mentors at Plumley, but with clients as well. In addition, the hands-on experience has helped me to validate my anticipated career path, as I had no prior experience in the environmental engineering field. My internship has motivated me to sit for the Fundamentals of Engineering exam, which is the first step toward licensure as a professional engineer. Interning with Plumley Engineering has been a great opportunity for me to learn from professionals in the environmental engineering field, network with potential future employers, and learn about the requirements to be a professional environmental engineering consultant.

## KRISTINA GUTCHESS

Ph.D. student, Earth Sciences

In fall 2016, I served as an instructor of record in the geology department at the State University of New York College at Cortland (SUNY Cortland). I taught two sections of a physical geology laboratory class and one section of a “Natural Hazards and Disasters” class. I was solely responsible for the compilation and creation of all course content including lecture materials, assignments, and assessments. As an alumnus of SUNY Cortland, I was uniquely qualified to teach the 100 students enrolled in my classes.

The Physical Geology Laboratory class met for three hours each week. My students participated in a variety of activities, including identifying mineral and rock specimens, reading and interpreting geologic maps,

measuring and experimenting with water flow parameters using Darcy Tubes, and even simulating and measuring meteorite impact craters! SUNY Cortland's campus is in the heart of New York State's Finger Lakes region. Its location enabled me to take the students to observe geologic phenomena outside of the classroom: we visited local rock outcrops, fossil localities, and glacial landforms.

“Natural Hazards and Disasters” was a unique and dynamic course for me to teach. Lesson plans often changed quickly – as natural disasters in the real world occurred throughout the semester– from earthquakes in central Italy and New Zealand to hurricanes along the East Coast of the United States. Students studied the occurrence and impact of geologic hazards across the Earth and through time through a series of group activities. The course concluded with each student preparing an individualized comprehensive preparedness report for a natural hazard in a setting of personal significance to him or her.

My professional development specialization area as an EMPOWER trainee is science education. This experience was essential for my career aspirations. Without the support of EMPOWER, I would not have been able to pursue this opportunity, which has allowed me to kick-start my career path. I now have teaching materials for two full courses and have received valuable, constructive feedback on my teaching styles, which will most definitely help in future teaching endeavors.



Steve Sartori

SYRACUSE UNIVERSITY  
**EMPOWER**  
Education Model Program on Water-Energy Research

204 Heroy Geology Laboratory  
Syracuse University  
Syracuse, NY 13244

### LEADERSHIP TEAM

#### Earth Sciences

Christopher Junium, Organic Geochemistry  
Laura Lautz, Hydrology  
Christopher Scholz, Sedimentary Basin Analysis  
Donald Siegel, Hydrogeology

#### Civil and Environmental Engineering

Charles Driscoll, Environmental Engineering  
Chris Johnson, Environmental Chemistry

#### Chemistry

Tara Kahan, Environmental & Atmospheric Chemistry

#### Maxwell School of Citizenship and Public Affairs

Peter Wilcoxon, Energy Economics

#### S.I. Newhouse School of Public Communications

Donald Torrance, Science Communication

### CONTACT

Visit [empower.syr.edu](http://empower.syr.edu) for our calendar of events, full news stories, and the latest program information.

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News from

# EMPOWER

SPRING 2017

## Leading the Way EMPOWER charts new paths at water-energy nexus





# From the Director

This past fall, EMPOWER trainees Kyle Blaha, Nathan Chien, Emily Gaub, Geoff Millard, and JR Slosson led a class discussion of the book “Lifeblood: Oil, Freedom, and the Forces of Capital” in the Water-Energy Seminar. The book is written by Matt Huber, associate professor of geography at Syracuse University, who specializes in political economy, historical geography, energy, and capitalism. The book discussion introduced us to the concepts of neoliberalism, market-based solutions to climate change, and the implications of framing energy policy as a “carbon tax.” The result was a lively discussion of topics a bit outside of our traditional wheelhouse! The following week, Huber joined our class to discuss his book, give his perspective on economic climate policies, and explore the role of morality in addressing climate change. During Huber’s seminar, it was impressive to see every individual in the class ask a question; such broad engagement with visiting scholars outside of our traditional disciplinary focus is one of the main goals of the Water-Energy Seminar. You can read about his visit in a news piece written by the students for the EMPOWER website ([empower.syr.edu](http://empower.syr.edu)).

The Water-Energy Seminar is a cornerstone of EMPOWER, bringing together faculty and students every week for similar lively discussions of scientific literature and presentations by visiting scholars. In the seminar we have also tackled professional development topics, such as hosting a mock National Science Foundation panel to review grant proposals, acting as journal editors during peer-review of a manuscript, and “sketching our science” to improve communication skills. This spring, we are hosting an alumni panel to discuss careers open to our trainees. We are also preparing for our upcoming summer field course, which will take the group from Fayetteville’s Green Lakes to Hubbard Brook, New Hampshire. Every semester in the Water-Energy Seminar is different, with new topics, new faces, and new ideas. Every semester, I look forward to seeing where the conversation leads us.

—LAURA LAUTZ, Director, EMPOWER

ON THE COVER: Trainees JR Slosson, Sam Caldwell, and Robin Glas speak with EMPOWER faculty member Chris Scholz at the Suite 333 Grand Opening Reception. Photograph courtesy of Steve Sartori.



From left, Changcheng Pu and Robin Glas in discussion in Water-Energy Seminar.

## Suite 333 Grand Opening Reception Brings Together Faculty, Students, and University Administrators

EMPOWER celebrated the opening of new collaborative space in Suite 333 of the Heroy Geology Laboratory during a reception on October 25. Syracuse’s new vice chancellor and provost, Michele Wheatly, whose office funded the major space renovation, joined University administrators and faculty to hear remarks by EMPOWER Program Director Laura Lautz on the program’s goals and accomplishments. Members of EMPOWER’s leadership team and trainees additionally shared their experiences and insights.

The evening included a poster session highlighting the accomplishments of eight EMPOWER trainees. “Student Spotlight” posters featured students’ experiences with EMPOWER training elements, including the Water-Energy Seminar, interdisciplinary research, professional development, and Career Pathway experiences.

David Zheng, a Ph.D. student in mechanical and aerospace engineering, described his



Michele Wheatly and Laura Lautz at the Suite 333 Grand Opening Reception.

experiences in the Water-Energy Seminar: “The greatest advantage is to meet friends and mentors from different backgrounds, but with similar goals – we are hoping to achieve an energy-water sustainable society.”

Geoff Millard, a Ph.D. student in civil and environmental engineering, is pursuing a certificate in sustainable enterprise through the Whitman School of Management. “I learned strategies to work and lead diverse groups of people towards specific goals,” he said. “I am looking forward to continuing my professional development through the EMPOWER program.”

Suite 333 includes two conference rooms, meeting spaces, a study area, and faculty offices.

For pictures and a video of the event, please see [empower.syr.edu](http://empower.syr.edu). The “Student Spotlight” posters are now displayed in Suite 333.

## Seed Grant Program Launched

EMPOWER recently launched its Seed Grant Program, which is designed to support students in ways not covered by traditional research grants or assistantships. The EMPOWER Research Committee developed three funding opportunities for specific research and professional development activities: (1) **Professional Development Training Mini-Grants** support participation in professional development training opportunities; (2) **Professional Network Development Grants** cultivate trainees’ professional connections external to Syracuse University; and (3) **Emerging**

**Interdisciplinary Research Seed Grants** support student-centered lines of research for integration of technical and professional training. The Seed Grant Program was formally launched in fall 2016.

Examples of recently funded proposals include:

*Investigation of Growth Rates of Lacustrine Carbonate Deposits, Winnemucca Dry Lake, Nevada* Emerging Interdisciplinary Research Seed Grant, by Laura DeMott, Ph.D. student, Earth Sciences

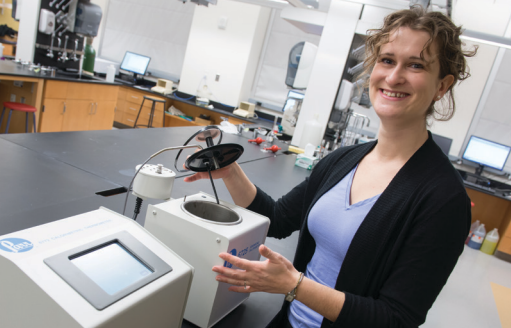
## Faculty Spotlight

### TARA KAHAN

assistant professor of chemistry in the College of Arts and Sciences

Pollutants associated with energy extraction and use can react with sunlight to form toxic products that are harmful to aquatic ecosystems and aquatic and terrestrial mammals. As the Arctic warms and new shipping routes become available, human activity will escalate, thereby increasing pollutant loadings. While pollutant reactivity toward sunlight has been extensively studied in liquid water, reactivity on ice surfaces has not received the same scholarly attention. Since large portions of the Arctic are frozen for at least several months each year, it is necessary to understand what factors control pollutant reactivity in this region to accurately predict the effects of increased human activity on air and water quality.

EMPOWER NRT Co-PI Tara Kahan received a Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF) in 2015 to learn more about how pollutants react on snow and ice. This most prestigious award is offered to junior faculty who exemplify the role of teacher-scholar



through outstanding research, excellent education, and the integration of education and research.

Kahan’s research will help inform policy to protect the environment and human health in snow-covered locations across the globe. Additionally, this work includes an educational component: local middle-school children will attend a weeklong summer workshop where they will learn about environmental issues facing Syracuse and will interview an environmental scientist. These interviews will be displayed for the public as videos, posters, and blogs as a temporary exhibit at the Milton J. Rubenstein Museum of Science and Technology in downtown Syracuse.

For more information on Kahan’s research, visit [sumagazine.syr.edu](http://sumagazine.syr.edu). For more information about Faculty Early Career Development Awards, visit [nsf.gov](http://nsf.gov).

*Research Presentation, Mentorship, and Networking at the American Geophysical Union Annual Meeting* Professional Network Development Grant, by Alexis Stathis, Ph.D. student, Chemistry

*The New MODFLOW Course: Theory and Hands-On Applications* Professional Development Training Mini-Grant, by Nathan Chien, M.S. student, Earth Sciences

*Attending the American Association for the Advancement of Science Annual Meeting* Professional Development Training Mini-Grant,

by master’s degree students Sara Alesi and Megan Daley (civil and environmental engineering) and JR Slosson (Earth sciences); and Ph.D. students Caitlin Eger and Yige Yang (civil and environmental engineering) and Alexa Stathis (chemistry).

For more information about this program, please see [empower.syr.edu](http://empower.syr.edu)

## Q&A

with External Advisor Kevin Bohacs

EMPOWER is supported by an **External Advisory Committee (EAC)**, which is comprised of professionals in non-academic careers, including energy, advocacy, government research, environmental consulting, and STEM education. The EAC provides guidance for programming to ensure high-level performance of EMPOWER graduates in the workplace.

**Q Tell us a little bit about your current position. How did you get this job?**

**A** I am a senior research scientist with responsibility for sedimentology, stratigraphy, and hydrocarbon systems research and applications. I lead a team that develops new methods for effective, efficient, and environmentally sound exploration and production. As part of our research, we reconstruct paleo-environmental conditions: oceanography, climate, tectonics, and ecosystems, through a delightful combination of field work, lab analyses, and subsurface investigations.

I joined Exxon’s research lab right out of graduate school, starting with the Clastic Facies and Stratigraphy group working on incorporating process-based sedimentology to sequence stratigraphy. In the mid-1980s, I joined the Petroleum Geochemistry group to add a good dose of geo- to geochemistry, working on shales and mudstones and their role in the global carbon cycle and how to predict their potential as hydrocarbon sources. Since then, I have conducted field work on six continents and across more than 36 countries, on all sorts of mudstone, from deep marine to swamps and lakes. It has been a wonderful way to learn about organic geochemistry, microbiology, sedimentary petrography, paleoclimate, paleo-oceanography, seismic and well-log interpretation through collaboration with leading experts in corporations and universities.

**Q What might readers not know about your background? Anything unexpected?**

**A** I graduated from one of the first paramedic classes in Connecticut, served as a volunteer firefighter for 10 years, and worked my way through college and graduate school with various emergency medical services. I also volunteer with the American Red Cross as a first aid-CPR instructor and trainer and as a Disaster Relief Services generalist. I was asked to serve as American Red Cross Disaster Services chair for the Gulf Coast region during Hurricane Katrina and Rita and their aftermath.

**Q What do you hope to see as outcomes for the EMPOWER program?**

**A** I really like EMPOWER’s emphasis on training well-rounded scientists who are able to accurately define key problems, solve those problems in a collaborative, interdisciplinary way, and communicate their results to scientists and citizens alike. We need scientists with this range of skills to provide the solid, objective basis for sound decision making that balances the many competing interests of our society.

**Q As a Ph.D. scientist yourself, what advice would you give our EMPOWER trainees?**

**A** Communicate, collaborate, participate in the scientific community, and have fun—doing good science is quite rewarding on many levels.

Kevin M. Bohacs is a senior research scientist with ExxonMobil Upstream Research Company.