It’s hard to believe that we’ve come to the end of yet another semester here at Penn Engineering. It’s been another busy semester for AWE and I hope you enjoy reading about some of things we’ve been up to in this edition of the @pennawe.

One thing that has been keeping us busy this semester is a new partnership with the Gashora Girls Academy of Science and Technology (GGAST) in Rwanda. GGAST’s mission is “to help Rwanda realize its promise by educating, inspiring, and transforming its young women to be the future entrepreneurs, family and community leaders of a country, which already is distinguished by having the highest percentage of women in its government of any nation in the world.” GGAST graduated its first class just this past November and we are proud that they are sending one of their graduates to Penn Engineering this fall.

The partnership with GGAST is multi-layered. We began with an online mentoring program between our Penn engineering women and some of the Gashora students. They have spent the semester learning about one another and providing advice on everything from what it’s like to be in college to suggestions on how to build a cell phone app!

This summer the partnership continues with 2 Penn Engineering students doing internships at Gashora. Becky Baumher (sophomore, CIS) and Michale Goldberger (sophomore, EE) will spend the summer helping the Gashora girls to start two new clubs, one for robotics and one for solar energy. In addition, a Penn team made up of faculty, students and staff [myself included!] will be traveling to Gashora to do a site visit in hopes of sending a larger Penn student team in Summer 2015 to work on a solar energy project. The Penn team also includes a local partnership with the Agnes Irwin School here in Philadelphia, which will also work on the project.

It’s an exciting project and one that we look forward to continuing in the future. Just one of the many ways we are trying to think creatively about advancing women in engineering. I hope you enjoy reading about what else we are up to in this issue. As always, written nearly entirely by our current students, inside you will find stories about research, curriculum and alumni updates. And don’t forget, if you have an idea for a story get in touch with us at awe@seas.upenn.edu or find us on any of our many social media outlets! We even have a brand new instagram account so be sure to follow us at @awe_at_upenn!

For more information on Gashora Girls Academy of Science and Technology check out http://rwandagirlsinitiative.org/home/index 🌟
A DEPARTMENT EXPERIMENT

After considering alumnae feedback and collaboration between engineering disciplines, Penn’s Department of Bioengineering (BE) implemented a new curriculum in Fall 2011. Undergraduate Chair for BE, Dr. Andrew Tsourkas, along with the BE faculty collectively developed the curriculum changes.

The Class of 2015 is the first group to experience the new changes which now require classes in every discipline of BE in order to expose students to a wider variety of areas within the field. During freshmen year, the traditional BE100 has been split into two half credit introductory classes, one in each semester, to continue to foster a sense of community during freshmen year and to create more flexibility for pre-med students.

The major changes to sophomore year were driven by alumnae feedback to increase computing and statistics courses. This led to the addition of a formal engineering statistics class and a MATLAB computing class to better prepare students for future real-world experiences. In addition, sophomore year now includes two classes dedicated to popular areas of BE—Biomaterials and Biomechanics—each with a lab portion integrated within the class.

During junior year, the department has replaced the infamous six hour labs with two full semesters of a twice weekly three hour lab. The shorter lab meetings and the move of a required Cell Physiology class to Fall of senior year allow pre-med students more flexibility to fit Organic Chemistry into their schedules.

Overall, the department strived to utilize content from previous courses to continuously challenge the students to integrate their knowledge from their past to their current experiences. For example, a microfabrication lab during the junior year relies on the background knowledge of surface modification and contact angle measurements that students learned during both lab and lecture of Biomaterials and Chemistry. Although the Department is still working on some smaller changes, like adding presentation and writing experience, the changes were welcomed by students—especially the modification of the six hour labs! 😊

UPENN MASTER’S AND SUB-MATRICULATION PROGRAMS

Since my freshmen year in Penn’s Undergraduate BE program, I have been completely enthralled with Penn Engineering. In my sophomore year, I knew I would not be ready to leave Penn Engineering as a senior. So I immediately jumped at the opportunity to apply for Penn’s sub-matriculation program in BE and joined the master’s Class of 2014.

As of Fall 2013, a total of 1,421 graduate students are enrolled in Penn engineering, of whom 900 students are registered in one of Penn Engineering’s 14 master degree offerings as of Fall 2013. The largest master’s programs include Biotechnology, Computer & Information Science, and Mechanical Engineering. In these programs, Penn does a wonderful job supporting and encouraging women engineers. There are currently 300 female master’s students registered, with Materials Science & Engineering leading with the highest female ratio.

My master’s program has allowed me to integrate my education to build a curriculum that fits my career pursuits. In this year alone, I have increased my knowledge in healthcare policy, vaccine development, and biostatistics methods. Penn’s master’s programs welcome students from many different academic backgrounds and career experiences. It has been a pleasure to meet and work with such a unique set of colleagues. Plus, who can deny the opportunity to have more time to enjoy Penn’s campus? 😊
In its second year, the UPenn Y-Prize competition came to a culmination this April, announcing the winner of the four finalists to be a one-woman team! Emily Plumb, MS student in Mechanical Engineering, beat out three other teams, each composed of 2-6 students from SAS, SEAS, or (mostly) Wharton. She received $5,000 and the opportunity to pitch her business plan to IP Group, an intellectual property commercialization company.

The Y-Prize is a business plan competition focused on bringing cutting-edge robotics technology out of the laboratories at Penn and into the marketplace to fill a real-world unmet need. Each year, four finalists are selected from the pool of applicants to pitch their plan to a panel of judges composed of industry leaders and venture capitalists. Teams are allotted 10 minutes for their pitch, followed by a brief Q&A session. The grand prize winner is announced at the end of the night, and while the winner is given the biggest prize to take home, the remaining finalists are also given $1,000 as recognition of their achievements. The event itself is a collaboration between the Mack Institute for Innovation Management at the Wharton School and the General Robotics, Automation, Sensing, and Perception (GRASP) Lab at SEAS.

This year’s winner, Emily, pitched an idea that came out of her work with GRASP’s Kodlab: the T-Rhex (Teaching Robot Hexapod). During her presentation, Emily passionately and enthusiastically explained how this robot could serve as a major platform for inspiring STEM interest in young children. The robot can be used as a tool for teaching students about concepts in physics and engineering that are demonstrated through hands-on interactions with the T-Rhex. For more information on the T-Rhex or any of the other finalist ideas, check out [http://yprize.upenn.edu/](http://yprize.upenn.edu/). ☀️

Winner Emily Plumb is pictured here (left) with her GRASP Lab Tech Consultant Gavin Kenneally and Wharton Business Consultant Isabelle Park. PHOTO BY: Michelle Eckert

MELISSA MYINT
PhD candidate in CBE
mmyint@seas.upenn.edu
How did you decide to pursue a PhD at the University of Pennsylvania?
Honestly, at first I was hoping to leave Philadelphia for graduate school. I’m from the area and went to Drexel for undergrad, so I wanted to experience a different part of the country. However, when I visited the GRASP Lab I realized that no one does robotics like Penn. Having electrical engineers, mechanical engineers, computer scientists, and even some bioengineers working in such close proximity created an amazing environment. It allowed great cross-pollination of ideas that you just can’t get when roboticists are segregated by departments.

What made you decide to become a professor?
I really wanted the academic freedom that comes with being a professor. I now have the opportunity to work on any problem in robotics that I choose to pursue.

What do you study?
I work on finding new ways to control a group of robots as they navigate complex environments with many obstacles. Groups consisting of even simple robots can do a lot more than any one very complex robot. When working with groups of robots things become very flexible; you can use robots of varying capabilities and it’s not a big deal if one robot breaks down.

What is your favorite research project that you’ve completed to date?
I have a paper in the upcoming International Conference for Robotics and Automation that describes a system I made that allows an operator to control a group of quadrotors using the multi-touch capabilities of an iPad, with guarantees of safety. I think it’s really neat that we’ve allowed people to control something very complicated with such a simple interface. People are able to use the system even if they’ve never seen a quadrotor before.

What was your favorite thing about Penn?
The people in the GRASP Lab! I made a lot of great friends during my time as a PhD student. There was a great sense of camaraderie in the GRASP Lab. It’s great that this is something that I didn’t have to lose after graduation. I love seeing the other GRASPees at different robotics conferences.

What do you like most about being a professor?
I really love working with students, particularly being able to see them develop as engineers. I’ve been working with a group of students since I’ve started at USC and it’s been really satisfying watching them improve vastly over the course of this past year.

What’s one surprising thing about you?
I actually miss having rain and snow! ☀️
Kate Santullo Sproul is a graduate of Penn’s Nanotechnology master’s degree program and a product development chemist at Henry Company, dealing with building materials and how they react at the nanoscale. Currently, her team is working to develop new formulations of wax emulsions that are used in a variety of materials. She graduated from the Stevens Institute of Technology with a Bachelor’s degree in Chemistry.

When reflecting upon what first piqued her interest in chemistry and nanotechnology, Kate cites her high school chemistry teacher: “In my junior year of high school, I was lucky enough to have an amazing Chemistry teacher (Mr. Hisim). He made me fall in love with chemistry — the reactions, the equations, the lab experiments. I excelled in AP Chemistry the following year and knew that [chemistry] was what I was going to pursue as my major.”

Throughout her summers as an undergraduate, Kate worked in various research labs at the National Cancer Institute in Frederick, MD, working with retroviruses and natural products chemistry. The summer before her senior year, Kate obtained a research position at the Nanotechnology Characterization Lab, changing the path of her future forever. Focusing on the synthesis and characterization of rod- and sphere-shaped gold nanoparticles, Kate found great interest in this small sliver of the vast fields encompassed by nanotechnology. As a result, she began to search for nanotechnology graduate programs across the country and found a home in Penn’s nanotechnology program under role models such as Dr. Dawn Bonnell. In particular, Kate was drawn to this program for its flexibility that allows students to take classes from various engineering fields.

Though the majority of her classmates have been men since her first chemistry class in high school, Kate does not cite that as an issue that has ever hindered her abilities in or outside of the classroom. She has always had strong female role models in the classroom and lab, such as Dr. Bonnell. Reflecting on a conversation she had with Dr. Karina Zuck at her research lab sophomore year, Kate recalls, “I was only a sophomore in college, and I had my doubts about becoming a research scientist while also having the ability to raise a family. It was reassuring to talk with her and hear her advice on how to balance publishing research papers with taking your daughter to ballet class.” When asked about how her gender has shaped her role in the nanotechnology and building materials industries, Kate remarks, “I’ve never thought of myself as a woman in a classroom full of men. I’ve always just thought of myself as another student learning the material, or another team member working to solve the goal.”

“I’ve never thought of myself as a woman in a classroom full of men. I’ve always just thought of myself as another student learning the material, or another team member working to solve the goal.”

PHOTO BY: Felice Macera
FIVE MINUTES WITH DANI BASSETT

AWE sat down with Skirkanich Assistant Professor of Innovation Dani Bassett, a new member of the Penn Engineering faculty. As a Fulbright scholar and neuroscience researcher Dr. Bassett has a lot to say about the intersection of her own research, her experience abroad, and her take on being a woman engineer.

On her research: I started a Complex Systems Group at Penn. We look at complex systems: systems that are made up of a multitude of smaller, component parts that have complex interactions. I’m especially interested in network neuroscience and studying how we can use a systems approach to model neuron interactions in the brain.

An intriguing application of her research: One area that I’m most excited about is combining network science and neuroscience to study how people learn. We are studying where in the brain learning occurs and modeling interactions in those regions to predict what makes someone a good learner. Through our research, we’ve shown that the key to learning is brain flexibility and have been able to quantify the effects on learning outcomes.

On being a woman in engineering: I believe women can and should have it all. Being a woman has not held me back. I try to mentor other women engineers at all levels.

On studying Physics: Being a concert pianist didn’t pan out so I chose my second passion: Physics. My dad wanted me to go into medicine, but I wasn’t cut out for that—I’m more of a theorist. My current research forms the perfect intersection of biology, neuroscience, and physics.

On her Fulbright scholarship and studying at Cambridge: My scholarship was a dual program with NIH where I got to focus on the more psychological aspects of my research. While I studied at Cambridge I focused on the Physics aspect (and captained the crew team in her spare time).

You might be surprised to learn about Dani: I’m a twin! And the second oldest (my twin claims to be older) of eleven children. 👯

DANIELLE S. BASSETT
Skirkanich Assistant Professor of Innovation
Dept: Bioengineering (BE) & Electrical and Systems Engineering (ESE)
PhD (Physics), University of Cambridge, ’09
CPGS (Physics), University of Cambridge, ’05
BS (Physics), Pennsylvania State University, ’04
Website: http://www.danisbassett.com/
Email: dsb@seas.upenn.edu

PHOTO BY: Kevin Monko

ANNIE MROZ
BSE in MEAM, MSE in MEAM ’14
amroz@seas.upenn.edu
ABRAHAM RESEARCH AWARD

The Abraham Research Award is intended to support a female undergraduate student conducting research at SEAS for the summer. Chang Su, a rising junior majoring in Bioengineering is this year’s winner of the Abraham award. This summer, she will join Dr. David Meaney’s research lab, which focuses on traumatic brain injury. Specifically, she will be studying the role of mitochondria motility in neuronal network activity after injury.

NATIONAL SCIENCE FOUNDATION GRADUATE RESEARCH FELLOWSHIP

This year three Penn Engineering women, both alumnae and current students, won the prestigious NSF Graduate Research Fellowship. The program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master’s and doctoral degrees at accredited American institutions.

Connie Wu (EE ’13, WH ’13) will be attending Stanford University’s Electrical Engineering PhD program starting in the fall. Her focus of study will be on biomedical devices and diagnostic/monitoring applications.

Rebecca Winter (bachelor’s degree in Environmental Engineering from Columbia University, ’13) is currently a first year graduate student in Penn’s Mechanical Engineering PhD program. She is in Dr. Haim Bau and Dr. Howard Hu’s lab studying flow capacitors for energy storage.

Chantal Marie-Jeanne de Bakker (bachelor’s degree in Biomedical Engineering from Boston University, ’12) is now a second-year PhD student at Penn’s Bioengineering department. She works in Dr. X. Sherry Liu’s lab, studying the effects of pregnancy, lactation, and weaning on maternal bone structure.

Congratulations to all of the winners! We are also lucky to have two students recognized this year as honorable mentions: Elizabeth Feeney (BE) and Lydia Atangcho (CBE).

JAROS BAUM & BOLLES AWARD

The Jaros Baum & Bolles Award was established in 2008 by Letetia Tedori Callinan (MEAM ’83) and is awarded to a Penn Engineering student who has demonstrated a commitment to advancing women in engineering (e.g., through mentoring or as a role model). Since 2008, we have recognized many of our amazing women student leaders who are all now doing equally amazing things in their careers.

Allison Pearce (CIS ’14) is this year’s Jaros Baum & Bolles award winner. In addition to being an outstanding student and role model, Allison has served as a mentor for the AWE/SWE mentoring program, treasurer of the Women in Computer Science (WICS) student organization, an orientation peer advisor; and a mentor for Dining Philosophers.

Allison will spend next year at the University of Cambridge getting a master’s in computer science as a winner of the Thouron Award. The Thouron Award, a graduate exchange program between Penn and British universities, aims to improve relations between the U.K. Winners and the United States. Winners receive tuition and stipends to help them complete their graduate degree. It seeks to create an ever-growing number of leading citizens of these two countries who would have a thorough understanding of their trans-Atlantic counterparts. Today it is a leading international scholarship program and experience in friendship, with more than 700 alumni awards and honors.
Advancing Women in Engineering
University of Pennsylvania
210 S. 33rd Street
109 Towne
Philadelphia, PA 19104-6321

Opt-Out Information
If you don’t wish to receive information about AWE, you may opt out at www.alumni.upenn.edu/optout.
Update your address/email at www.alumni.upenn.edu.

support the future.
Consider giving to Advancing Women in Engineering at www.seas.upenn.edu/giving.

three easy ways to stay in touch...
facebook.com/groups/awealumni/
@pennawe
penn-awe.blogspot.com/
awe_at_upenn

contribute to our newsletter!
Want more information about AWE or just have questions about Penn Engineering?
Contact Michele Grab at mgrab@seas.upenn.edu

The AWE program is dedicated to recruiting, retaining, and promoting women within Penn Engineering. Our goals are to:

Develop and support initiatives to increase the number of women interested in studying engineering at Penn and elsewhere.

Enhance the overall academic experience of female students in Penn Engineering via targeted curricular development and increased research and professional opportunities.

Create and support social and networking opportunities for women in engineering.