Rethinking training for Cornell STEM graduate students & postdoctoral scholars

Why?

Because a majority of us will end up working outside academia. It’s time to rethink, retrain and be ready for tomorrow’s careers.

A nationwide consortium
Sharing BEST practices

www.BEST.cornell.edu

Contact:
Susi Sturzenegger Varvayanis
Senior Director
BEST Program: Broadening Experiences in Scientific Training
Graduate Research & Education
CORNELL UNIVERSITY
S2-018 Schurman / 325 Caldwell Hall
Ithaca, NY 14853
607.253.4304
sv27@cornell.edu

www.BEST.cornell.edu

Cornell BEST Program

Broadening Experiences in Scientific Training
Many of the skills you will acquire in the BEST program will also help you in an academic career of your choice. Science Communication and Management knowledge for instance can help you run your academic laboratory and convince funding agencies.

Opportunity pathways

Science Communication
*Scientific writing, editing and media skills*
- weekend science communication workshop
- coursework in journalism; intern with the Chronicle
- write a press release, develop a podcast or blog

Science policy
*Learn how policy is created*
- externship in Albany
- prepare and pitch a bill for congressional consideration
- take a course in science policy

Governance, Risk & Compliance
*Learn how to assess bio- or agroterrorism risk*
- externship with the FDA or CDC over spring break
- visit biocontainment facilities & learn how they’re run
- certificates on quality assurance, good lab practices

Industry, Entrepreneurship & Management
- leadership & management courses
- invite and interact with industry speakers
- internship with a life sciences startup
- develop the commercial aspects of your technology

Academic Research:
Many of the skills you will acquire in the BEST program will also help you in an academic career of your choice. Science Communication and Management knowledge for instance can help you run your academic laboratory and convince funding agencies.

Kathleen Hefferon, Department of Food Sciences, Postdoctoral Researcher | kih22@cornell.edu

Kathleen Hefferon received her PhD from the Department of Medical Biophysics, University of Toronto and continued her post-doctoral studies at Cornell University. Dr. Hefferon has worked on faculty at the Division of Nutritional Sciences at Cornell and has written two books on generating biopharmaceuticals in plants. She has taught and conducted research at both the University of Toronto and Cornell University. Kathleen has 4 patents, has edited 6 books, and has multiple research publications. Kathleen is currently working as a postdoc in the Department of Food Sciences at Cornell.

Research Interests include agricultural biotechnology, public health, developing countries, transgenic plants, food security, infectious disease, virus expression vectors, microbial cellulases for biofuel development.
**ASAP, Advancing Science And Policy club**

We are a group of Cornell graduate students, post-docs, and faculty interested in the intersection of science and policy. We aim to engage our members in the policy making process and educate the public about the role of scientific input in advancing society. Our activities include regular roundtable discussions on pertinent science policy topics, annual trips to Washington D.C, inviting guest speakers, writing/blogging, and outreach.

This year some hot topics we covered during our discussions included the ethical implications of germline editing using the novel biotechnology of CRISPR-CAS9, drones and advances in technology, the internal review board that oversees human participants in research at Cornell, and the 21rst Century Cures Act. In addition, we recently updated our website to include a blog and are beginning to include posts about our discussions with the hope of reaching broader audiences.

See the next few pages for descriptions about some of our ASAP members.

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**Susi Varvayanis, Senior Director, Cornell BEST Program**

Susi came to Cornell in 1988 and is currently Senior Director for Cornell’s Broadening Experiences in Scientific Training, or BEST program. Previously, she was Business Development Officer at the Institute of Biotechnology and liaison to the McGovern Center for Venture Development in the Life Sciences, the on-campus business incubator, where she helped fill the pipeline of early stage technologies and entrepreneurs emanating from the university.

Since 2009, Susi was a host city coordinator for the statewide Pre-Seed Workshop (PSW) to evaluate high tech ideas for commercial potential. She then launched the PSW in Switzerland while she was Chief Operating Officer for a Swiss National Science Foundation Center for Research Excellence bringing together the fields of chemistry and biology. While there she also had responsibility for the center’s technology transfer, science communication, advancement of women in science, and education and training efforts.

At Cornell, Susi managed for six years the prestigious University-wide Presidential Life Science Fellowship (PLSF) program for first year graduate students, and the Center for Advanced Technology (CAT) NYSTAR awards for ten years. Prior to Cornell, Susi worked in the NIH lab of Robert Gallo on retroviruses, and for Biotech Research Laboratories, Inc., a Maryland startup. She has co-authored over 30 peer-reviewed publications in cancer cell biology.

Her past includes managing a flow cytometry laboratory, and teaching at an international boys’ school in Switzerland. Susi earned a BA in Biological Sciences and French from Mount Holyoke College, and an MS in Microbiology & Immunology from Georgetown University.
As scientific and technological discoveries continue to change our world and society at a rapid pace, it has become imperative that our policymaking approach be informed by science. From energy policy to climate change, from health care to bioterrorism it has become critical to have professional scientists actively engaged in the policymaking process. However, a fundamental issue facing today's government is the fact that too few scientists have experience with the inner workings of public policymaking and too few policymakers have significant science or engineering knowledge. This gap needs to be bridged if we are to have a society where science informs the course we choose to take.

To help address this, we offer a class on science policy at Cornell that is targeted toward undergraduate and graduate students in science, technology, engineering, and mathematics (STEM) disciplines. Scientists and engineers in this course learn about the policymaking process through active research and advocacy work. Working in small groups students identify an issue at the intersection of science and public policy, thoroughly research it, formulate a detailed plan to address the issue, and produce the broad suite of documents (e.g. draft legislation or regulatory language, long and short form technical reports, op-eds or other press pieces) that would be necessary to impact policy.

We are always looking for policy experts inside and outside government who would be willing to talk with student groups and help them shape their policy projects in the course. If you would be willing to do this, please let Chris Schaffer know (cs385@cornell.edu).

Chris B. Schaffer, Associate Professor, Department of Biomedical Engineering, Cornell University

Chris B. Schaffer is an Associate Professor in the Meinig School of Biomedical Engineering and the Associate Dean of Faculty at Cornell University. Chris grew up in Jacksonville, FL and was an undergraduate at the University of Florida, where he studied physics. He received his PhD from Harvard University, also in physics, where he worked with Eric Mazur. He was then a post-doc in David Kleinfeld’s neuroscience laboratory at the University of California, San Diego.

He now runs a lab at Cornell that develops advanced optical techniques that enable quantitative imaging and targeted manipulation of individual cells in the central nervous system of rodents with the goal of constructing a microscopic-scale understanding of normal and disease-state physiological processes in the brain. One area of current focus is understanding the role of brain blood flow disruptions in the development of Alzheimer’s disease.

Chris is also active in developing novel educational strategies to teach science as a dynamic process for discovery that are used in outreach settings in middle and high-school science classes as well as in college-level courses. Chris also has a strong interest in science policy and spent a year in Washington, DC as a science policy fellow in the office of Senator Edward Markey. He continues to be active in policy, including through a science policy course he teaches.

Chris is an accomplished surfer, having ridden waves all over the world and surfed some “big wave” spots, including greater than 20 ft. waves at Todos Santos, Mexico.

Science Policy Course at Cornell

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Ismail El Baggari, Department of Physics, Fourth year graduate student at Cornell University | ie52@cornell.edu

An experimental particle physicist, Yangyang Cheng works on the CMS experiment, one of the two main experiments on the Large Hadron Collider (LHC) that smashes proton-proton beams at near the speed of light to probe the most fundamental building blocks of matter and their interactions. She plays a major role in the R&D for the inner pixel detector upgrade of the five story-high detector, a next-generation silicon tracking detector that will operate on the High Luminosity LHC (HL-LHC) in the year 2025. She has also done pioneering work in searches for dark matter produced at hadron colliders, and continues to look for new physics beyond the Standard Model. She received her PhD in physics from the University of Chicago in fall 2015, where she was also a student leader at the Institute of Politics (IOP) since its founding by Mr. David Axelrod in 2013. She served on the IOP’s Student Advisory Board from 2013-2015, was the sole student ambassador representing UChicago at Harvard Kennedy School’s National Campaign Program in 2014, and founded the IOP’s International Policy Program.

Born and raised in China, Yangyang came to the US after graduating college at age 19 to pursue her PhD. Living her own American dream thanks to US leadership and commitment to basic research, Yangyang is a passionate advocate for the importance of public and political support for science, as well as scientist participation and scientific thinking in the policy arena.

Atomic-scale electron microscopy image of an oxide material that has a variety of electronic and magnetic properties. Individual atoms and different elements can be seen. This work was performed on a microscope funded by an NSF Major Research Instrumentation (MRI) Program grant.

My name is Ismail El Baggari and I am a 4th year graduate student in physics at Cornell. In my work, I directly visualize and chart the atoms that make up electronic and energy materials. The ability to see matter at atomic resolution rests on long and sustained investments in basic and applied research. By understanding how the arrangement of atoms affects properties, we can control and design novel materials with superb functionalities.
Sabrina Solouki, Department of Biological and Biomedical Science in the Field of Immunology and Infectious Disease, Second year graduate at Cornell University | ss3457@cornell.edu

Fascinated by the complexity of the immune system and the various defense mechanisms in place to fight off pathogens, Sabrina Solouki’s research focuses on a range of topics that integrate immunology and microbiology. In the August laboratory, she examines the response of specialized T cells to the flu virus with the aim of potentiating vaccines. These CD8+T cells are responsible for creating the memory cells needed for recall during a secondary infection to prevent one from getting sick and hence are important in vaccine development. In addition to immune cells, with the Russell laboratory she has begun exploring novel quantification methods for the detection of HIV infected cells.

Sabrina was born and raised in Orange County, CA and attended the University of California, Los Angeles (UCLA) where she received her B.S. in Immunology, Microbiology, and Molecular Genetics with a minor in Political Science. She has always been interested in science policy and healthcare reform and during her undergraduate career had the ability to travel to Nicaragua to study the various medical issues that face the country while also learning first-hand about underdeveloped healthcare systems. She is now pursing her PhD at Cornell University, and intends to use the skills she has gained in her doctoral program to jumpstart a career in science policy. Ultimately, her goal is to facilitate politicians’ understanding of the nature of research and basic science to engender more effective local and global health policy and legislation.

Chelsea Gregg, Meinig School of Biomedical Engineering, Graduating PhD student | clg233@cornell.edu

Chelsea Gregg is currently a 5th year PhD student graduating in August 2016 from the biomedical engineering department. In her research, she has focused both on the development of new and adaptation of current 3D micro-computed tomography imaging technologies for evaluating mid-late stage live heart development. She has published multiple peer reviewed publications during her tenure at Cornell and regularly presents her work at the annual Biomedical Engineering Society Conference.

Outside of her work in the lab, Chelsea has been highly involved with science policy initiatives within the BEST program and throughout Cornell University. She began working on STEM education initiatives focusing on the National Science Foundation mandating stricter standards for their “Broader Impacts” sections of grant proposals and demonstrating evidence that consistent scientific involvement in the education process is beneficial for both educators and their students.

In the Spring of 2015, Chelsea started her own science policy group, Advancing Science and Policy (ASAP) at Cornell University. ASAP is an entirely student run organization that fosters graduate student involvement in local, state, and national science policy fostering students in the public policy realm serving both as a scientific representative and a citizen. Upon graduation, she has accepted a highly competitive position as an AIMBE Scholar to work at the FDA in the Center for Devices and Radiological Health.