Phillip D. Long

Graduate Institution: University of Chicago

Graduate Discipline: Biophysics

Hometown: Spokane, WA

Relevant SC Research: Basic Energy Sciences

Research Interest:

I am interested in the remarkable energy-transfer mechanisms photosynthetic organisms have developed over billions of evolutionary years. These organisms could provide important insights for biomimetic light-harvesting materials. Given the scope and mounting inevitability of the global energy crisis, new modes of capturing and harnessing readily available energy (such as solar energy) must be explored. The pigment-protein complexes contained in photosynthetic plants, algae, and bacteria appear to utilize an extremely sophisticated form of non-classical, coherent energy transfer. This phenomenon could serve to explain the astronomical quantum-efficiency and speed involved in solar light harvesting. Given the increasingly interdisciplinary nature of science, I sought a program and research project that would challenge me to simultaneously engage in the physical and biological sciences. Therefore, my daily work and interests span the areas of optics, quantum chemistry, and molecular biology. Other research interests include nanomaterials and microscopy.

About Me:

My core interest lies in applying inter-disciplinary scientific thinking to tackle the mounting energy crisis. My thesis research seeks to decipher how nature manages to harvest energy from nearly every absorbed photon. Although the basic science questions alone captivate my interest, the potential societal impact redoubles that motivation. I took an unusual path to this graduate course: After completing undergraduate studies in physical chemistry and history, I worked in science policy at the National Academies in Washington, DC. This experience not only imbued in me the drive to pursue biophysics, but also taught me the fundamental need for scientifically trained communicators to bridge the divide between Congress and researchers. I hope to somehow contribute to this field again.

Among my past academic achievements, I participated in an NSF-REU research experience in inorganic chemistry and was awarded one of three scholarships given annually by the Portland, OR section of the ACS to regional undergraduates. I am now a member of the Biophysical Society. I tutor Leadership Alliance students from local Chicago universities to support the program's goal of developing underrepresented minorities into leaders in academia, business, and the public sector. I also serve as a student-leader in my graduate program to ensure the continued success of our young and innovative approach.

I maintain active interests outside the lab. Participation in Chicago recreational soccer leagues keeps my muscles limber. Novels, of the graphic and non-graphic sort, provide a much-needed literary outlet. Chicago offers countless cultural opportunities and, when possible, I travel domestically and internationally to seek new adventures. Along those lines, I'm working hard to graduate from the monolingual category to the bilingual (and beyond) category.