



Stephan Hoyer

Graduate Institution: University of California-Berkeley

Graduate Discipline: Theoretical Chemical Physics

Hometown: Portland, OR

Relevant SC Research: Basic Energy Sciences

Research Interest:

My PhD research is on the role of quantum coherence between electronic excited states in photosynthetic energy transfer. My approach has been to apply tools and concepts from quantum information science and quantum computation to study these quantum biological systems. Specifically, my research has focused in two areas:

(1) Theoretical dynamics – How can we relate experimentally observed quantum beats between pigments in photosynthetic pigment-protein complexes to biological function?

(2) Ultrafast spectroscopy and control – How should we shape femtosecond pulses to optimally characterize excited state dynamics in light-harvesting systems, using non-linear techniques such as pump-probe or two-dimensional electronic spectroscopy?

About Me:

I graduated from Swarthmore College in spring 2008 with a BA in physics with High Honors and Phi Beta Kappa. In fall 2008, I enrolled as a PhD student

in physics at UC Berkeley and quickly began research in “quantum biology” under Professor of Chemistry Birgitta Whaley. At Berkeley, I have been involved with the Compass Project, a graduate student run project to create a community for undergraduates and to increase the participation of underrepresented minorities in the physical sciences.

Two years into my PhD, I turned down the NSF GRFP and NDSEG fellowships, to accept the DOE SCGF. The DOE SCGF has allowed me to pursue several international collaborations, with leaders in the theoretical study of photosynthetic energy transfer. In particular, I have ongoing collaborations on ultrafast spectroscopy with Yuan-Chung Cheng at National Taiwan University in Taipei, Taiwan and on quantum control with the groups of Martin Plenio and Tommaso Calarco at Ulm University in Ulm, Germany.

My hobbies include hiking, international travel, and cooking.

I currently intend to pursue a career as a research scientist, either in academia or at a national laboratory.



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