



Andrew Davis Horning

Graduate Institution: Massachusetts Institute of Technology

Graduate Discipline: Physical Chemistry

Hometown: Spokane, WA

Relevant SC Research: Basic Energy Sciences

Research Interest:

Broadly, I am interested in the ways that fast chemical dynamics and fluctuations can be used to drive large scale chemical processes. Condensed phase chemical processes at room temperature undergo constant motion and thermal fluctuations. These little kicks can, in the right situation, cause large chemical changes. I have spent the past few years investigating how hydrogen bonds can pre-arrange proton transfer reactions and how the molecular dynamics of reacting species and the bath surrounding hydrogen bonded complexes can provide just enough push to cause the reaction to commence. In addition, I have become increasingly interested in how proteins and biomolecules can favor specific reaction paths by altering the fluctuation dynamics imposed upon a ligand, and I would like to utilize our new understanding and the new tools from studies of proton transfer and aqueous dynamics to describe and predict biological reactivity and specificity.

About Me:

I graduated from the University of Southern California in 2008, studying both chemistry and comparative literature, and I continue to be interested in the intersection between science and the humanities, with a particular curiosity in the visualization, semiotics, and modeling of physical phenomena. I am interested in both experimental and computational tools useful in chemistry and physics, and have extensively used both ultrafast

lasers and high performance computing resources to understand and describe the world. The tools of physics, chemistry, mathematics, and computer science all fascinate me, and I want to continue using the lessons of these disciplines to describe, predict, and design molecular and material properties.

In my spare time, I enjoy running, travelling, reading, and using computers for superfluous tasks. In addition, when the New England weather behaves itself, I voluntarily throw myself out of airplanes (with a parachute), and I have been skydiving over 200 times. It is one of my not-so-secret fantasies to combine my loves of both chemistry and skydiving, and I am currently planning formation skydives to create molecular shapes out of skydivers in freefall.



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