

Craig Charles Jolley

Arizona State University
Department of Physics
Tempe, AZ 85287-1504
craig.jolley@asu.edu

<http://www.public.asu.edu/~cjolley/>

1255 E. University Dr. #281
Tempe, AZ 85281
Home: (480) 829-9399
Cell: (480) 223-3548

Education

- **Doctor of Philosophy**, Physics, with emphasis in Biological Physics, [Arizona State University](#), Tempe, Arizona, December 2007
 - Dissertation Title: “[Structure and Dynamics in Photosystem I](#)”
 - Committee Members: [Michael F. Thorpe](#) (Co-chair), [Petra Fromme](#) (Co-chair), [S. Banu Ozkan](#), [John Spence](#), [Neal Woodbury](#)
- **Bachelor of Arts**, Chemistry and Physics, [Simon’s Rock College of Bard](#), Great Barrington MA, *Summa Cum Laude*, 2000
 - Thesis title: “A study of the mechanical properties of *G. cancriformis* web silk.”
 - Committee Members: [David Myers](#) (Chair), [Michael Bergman](#), [Eric Kramer](#)

Research Experience

- **Postdoctoral Research Associate**, [Center for Biological Physics](#), Arizona State University, January 2008-present
 - Supervisor: Mike Thorpe
 - Current focus is on developing improved techniques for constrained geometric simulations of biomolecules.
- **Graduate Research Associate**, [Department of Chemistry & Biochemistry](#), Arizona State University, Spring 2006 – Summer 2007
 - Supervisors: Petra Fromme & Mike Thorpe
 - Developed a method for the flexible fitting of high-resolution protein structures into electron density maps obtained by cryo-electron microscopy – this was part of a large, collaborative software development project using C++ in a Linux environment. Participated in the design, construction, and testing of equipment for time-correlated single-photon counting and fluorescence streak camera spectroscopy, and used it to characterize photosynthetic proteins from the green alga *Chlamydomonas reinhardtii*. Gained experience in the isolation and purification of large membrane protein assemblies.
- **Graduate Research Assistant**, [Department of Physics & Astronomy](#), Arizona State University, Summer 2004 – Fall 2005
 - Supervisors: Petra Fromme & Mike Thorpe
 - Projects included the study of photosynthetic membrane proteins using homology modeling and molecular dynamics methods, the application of coarse-grained dynamics methods to the assembly of large protein complexes, and the characterization of photosynthetic membrane proteins using ultrafast transient absorption spectroscopy and time-correlated single photon counting.
- **International Summer Research Project**, Max-Planck Institute for Bioinorganic Chemistry, Mülheim, Germany, Summer 2005
 - Supervisors: James Allen (ASU) & Wolfgang Lubitz (MPI)

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- Worked as part of a long-term collaboration between labs at Arizona State University and the Max-Planck Institute to characterize engineered photosynthetic reaction centers using electron paramagnetic resonance spectroscopy. Isolated and purified protein samples and worked with MPI scientists on biophysical characterization.
- **Research Assistant**, Biomolecular Nanotechnology IGERT, Arizona State University, Fall 2003
 - Supervisors: Neal Woodbury & JoAnn Williams
 - Collaborated with a team of graduate students in the physical and life sciences and engineering to develop a biologically-based method for photocatalytic hydrogen production. Received an introduction to a broad array of research techniques including bacterial cell culture, surface chemistry, and electrochemistry, as well as experience in a highly collaborative, interdisciplinary environment.

Publications (current and forthcoming)

1. **Jolley CC**, Rajagopal S, Lin S, Webber AN, Fromme P (2008). "Antenna reorganization in green algal PSI-LHCI probed by time-resolved fluorescence spectroscopy." *Submitted*.
2. **Jolley CC**, Wells SA, Fromme P, Thorpe MF (2008). "Fitting low-resolution cryo-EM electron density maps of proteins using constrained geometric simulations." *Biophys. J.* **94** (5), 1613-1621
3. **Jolley CC**, Wells SA, Hesperheide BM, Thorpe MF, Fromme P (2006). "Docking of Photosystem I subunit C using a constrained geometric simulation." *JACS* **128** (27), 8803-8812
4. Subramanyam R, **Jolley C**, Brune DC, Fromme P, Webber AN (2006). "Characterization of a novel Photosystem I-LHCI supercomplex isolated from *Chlamydomonas reinhardtii* under anaerobic (State II) conditions." *FEBS Letters* **580** (1), 233-238.
5. Sener MK, **Jolley C**, Ben-Shem A, Fromme P, Nelson N, Croce R, Schulten K (2005). "Comparison of the light-harvesting networks of plant and cyanobacterial photosystem I." *Biophys. J.* **89** (3), 1630-42.
6. **Jolley CC**, Ben-Shem A, Nelson N, Fromme P (2005). "Structure of plant photosystem I revealed by theoretical modeling." *J. Biol. Chem.* **280** (39), 33627-36
7. Grotjohann I, **Jolley C**, Fromme P (2004) "Evolution of photosynthesis and oxygen evolution: Implications from the structural comparison of Photosystems I and II." *Phys. Chem. Chem. Phys.* **6** (20) 4743-4753

Research Presentations

- Conference Presentations (Oral)

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- Arizona Biophest 2007, Tempe, AZ, "[Energy Transfer in Green Algal Photosystem I: Experiment and Theory.](#)"
- Rocky Mountain Regional Meeting of the American Chemical Society, Tucson, AZ, 2006, "[Flexible fitting of macromolecular structures to cryo-EM maps using constrained geometric simulations.](#)"
- 15th Western Photosynthesis Conference, Asilomar, CA, 2006, "[Assembly of the photosystem I stromal hump using a constrained geometric simulation](#)"
- Arizona Biophest 2005, Tempe, AZ, "Chlorophyll-driven folding of photosystem I"
- Arizona Biophest 2004, Tucson, AZ, "Plant photosystem I: Modeling a membrane protein supercomplex."
- Conference Presentations (Posters)
 - Biophysical Society 52nd Annual Meeting, Long Beach CA, 2008 "[FRODA-MD: A multiscale method for simulating protein dynamics.](#)"
 - Biophysical Society 51st Annual Meeting, Baltimore, MD, 2007 "[Flexible fitting of atomic structures into cryo-EM maps using constrained geometric simulations.](#)"
 - Flexibility, Rigidity, and Motion in Biomolecules Workshop, Tempe, AZ, 2006, "'Idealization' of protein crystal structures: progress and prospects."
 - [Chemical Biophysics Symposium](#), Toronto, Canada, 2005, "Structural role of (bacterio)chlorophyll in light-harvesting proteins."
 - International Congress of Photosynthesis, Montreal, Canada, 2004, "[All-atom model of plant PSI.](#)"
- Other presentations
 - Biological Physics Seminar, Arizona State University, 2006, "[Flexible fitting of macromolecular structures to low-resolution electron density maps using constrained geometric simulations](#)"
 - Department of Physics & Astronomy Graduate Student Seminar Series, Arizona State University, 2005, "Quantum Mechanics Meets Biology: Light-harvesting in Photosynthesis."
 - Flexweb Netmeeting Series, Arizona State University, 2005, "[Steering conformational changes with partial targeting](#)"

Teaching Experience

Teaching Assistant, Department of Chemistry & Biochemistry, Arizona State University
BCH 367: Elementary Biochemistry Lab, Supervisor: Scott Lefler (Fall 2007)

Teaching Assistant, Department of Physics & Astronomy, Arizona State University
PHY 121: University Physics I, Supervisor: Ralph Chamberlain (Spring 2004)
PHY 131: University Physics II, Supervisor: Carl Covatto (Spring 2003)

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Teaching Interests

General Physics	General Biochemistry
Biological Physics	Structural Biology
Computational Biology	Soft Condensed Matter
Physics for Biologists	Scientific Computing
Science and Society	

Honors and Awards

- [Young Bioenergeticist Award](#), Biophysical Society Bioenergetics Subgroup, 2008
- NSF Integrated Graduate Education Research Training (IGERT) Fellowship, Arizona State University, 2003
- Division of Natural Sciences and Mathematics Award, Simon's Rock College of Bard, 2000
- Acceleration to Excellence Program Scholarship, Simon's Rock College of Bard, 1996

Professional Development

- Co-chair for Gordan-Kenan Graduate Research Seminar in ["Photosynthesis and Bioenergy"](#) to be held in June 2008 in South Hadley, MA.
- [ASU Technology Ventures Clinic](#) Internship, Fall 2007. Worked with scientists, patent attorneys, and business experts at Arizona Technology Enterprises LLC to help bring technologies developed at ASU to market. Gained exposure to many aspects of the technology commercialization process while working on real-life projects.
- ["Science outside the lab: A science policy 'dis'-orientation"](#) workshop sponsored by ASU Center for Nanotechnology in Society, Washington, DC, Summer 2007. Assisted with organization and execution of a two-week trip in which science and engineering graduate students were immersed in issues including scientific funding, healthcare lobbying, environmental regulation, and Congressional appropriations.
- Meeting of Nobel Laureates in Chemistry, Lindau, Germany, Summer 2006
- Science Policy Workshop, Arizona State University Consortium for Science, Policy & Outcomes, Washington, DC, Summer 2004
- Theoretical and Computational Biophysics Workshop, Urbana-Champaign, IL, Summer 2003.

Professional Memberships

Biophysical Society

Language Proficiency

English (native language)
German (fluent conversation, basic translation)