David W.H. Swenson

1446 Martin Luther King, Jr. Way
Berkeley, CA 94709
317/270-2144
dwhs@hyperblazer.net
http://www.hyperblazer.net/

Education

2005-2011 **University of California, Berkeley**, *Doctor of Philosophy*.
Field: Physical Chemistry, Advisor: William H. Miller

2003-2005 **Université Louis Pasteur**, *Diplôme d'Études Universitaires Générales*.
Field: Mathématiques, Informatique, et Applications aux Sciences
Undergraduate degree in "mathematics, computer science, and applications to the sciences" from one of the top five universities in France.

1999-2003 **The Colorado College**, *Bachelor of Arts*.
Majors: Chemistry, French Literature, and Physics

1998-1999 **Indiana University-Purdue University, Indianapolis**.
Upper-division classes in French taken concurrently with senior year in high school.

Publications

David W.H. Swenson, Tal Levy, Guy Cohen, Eran Rabani, and William H. Miller. "Application of a semiclassical model for the second-quantized many-electron Hamiltonian to nonequilibrium quantum transport: The resonant level model." *J. Chem. Phys.* **134** (2011) 164103.

David W.H. Swenson, Heather M. Jaeger, and Clifford E. Dykstra. "Clustering of molecular hydrogen around benzene." *Chem. Phys.* **326** (2006) 329-334.

Heather M. Jaeger, David W.H. Swenson, and Clifford E. Dykstra. "Feature Article: Remarkable Features in the Interactions of Quadrupolar Molecules." *J. Phys. Chem. A* **110** (2006) 6399-6407.

Posters and Presentations

David W.H. Swenson, Tal Levy, Guy Cohen, Eran Rabani, and William H. Miller. "Semiclassical model for fermion dynamics (with applications to molecular electronics)." 242nd American Chemistry Society National Meeting: Denver, Colorado. August 28, 2011. (Oral Presentation)

David W.H. Swenson. "Transition Path Sampling Applied to Semiclassical IVRs." Mini Statistical Mechanics Meeting: Berkeley, California. January 14-16, 2011. (Poster)

David W.H. Swenson and William H. Miller. "Monodromy matrix calculation by the precision finite difference method." 239th American Chemical Society National Meeting: San Francisco, California. March 21-25, 2010. (Poster)

David W.H. Swenson and Cristian Predescu. "A Method for Solving Poisson Problems." Mini Statistical Mechanics Meeting: Berkeley, California. January 12-14, 2007. (Poster)

David W.H. Swenson, Laurent Bonnet, and Jean-Claude Rayez. "The State Distribution of the Associative Desorption of H_2 from a Pt(1 1 1) Surface." 2002 Undergraduate Research Poster Session: Gainesville, Florida. October 25-27, 2002. (Poster)

David W.H. Swenson and Jeffrey A. Cina. "Exploring the Ground State Potential of I_2-Ar." Inter-REU Workshop: 1st US/France Chemistry and Communication Meeting: Strasbourg, France. June 13-15, 2002. (Poster)

Awards

1999-2003 **Otis A. and Margaret T. Barnes Scholarship**, *The Colorado College*.
A four-year, full-tuition scholarship for chemistry majors.

1999-2003 **Central Newspapers Foundation Scholarship**, *Central Newspapers Foundation*.
A four-year, $10,000 scholarship for children of employees of Central Newspapers, Inc.

Research Employment Experience

Aug 2011 – Present **Tel Aviv University**.
Field: Theoretical Chemistry (Molecular Electronics), Advisor: Eran Rabani

2005–2011 **University of California, Berkeley**.
Field: Theoretical Chemistry (Semiclassical Dynamics), Advisor: William H. Miller
Worked on many aspects of the semiclassical initial value representation, particularly as it can be applied to systems with multiple electronic states. Projects include new methods for calculating the semiclassical prefactor, new approaches to reducing the number of trajectories required for semiclassical calculations, developing semiclassical approaches to treating fermion dynamics, and applications including energy transfer in large systems and molecular conduction.

Sept 2008 – Jan 2009 **D. E. Shaw Research, LLC**, *New York, NY*.
Field: Theoretical Chemistry/Computational Biology, Manager: John Klepeis
Developed code to calculate autocorrelation functions for velocity and orientation using a parallel framework based on Google's Map-Reduce architecture. Applied my code to verify selfdiffusion, viscosity, and orientational correlation of a novel water model, and to compare with pre-existing water models. Began applications toward heptane models.

Summers 2003-2005 **Indiana University-Purdue University Indianapolis**.
Field: Theoretical Chemistry, Advisor: Clifford E. Dykstra
Developed a potential energy surface to describe the clustering of molecular hydrogen around a single benzene molecule. Used that model to study clusters of up to 20 hydrogen molecules around benzene.

Summer 2002 **Université Bordeaux I**.
Field: Theoretical Chemistry, Advisors: Jean-Claude Rayez and Laurent Bonnet
Began work on a quasiclassical trajectory simulation to determine product state distributions from the associative desorption of hydrogen from a Pt(1 1 1) surface.

Summer 2001 **University of Oregon**.
Field: Theoretical Chemistry, Advisor: Jeffrey A. Cina
Studied the potential energy surface of the I_2–Ar system in preparation for theoretical studies of the pump-probe spectroscopy of I_2 in an argon matrix. Analyzed the viability of using a computer algebra system as a tool in theoretical chemistry.

Summer 2000 **The Colorado College**.
Field: Natural Product Synthesis, Advisors: Nick Drapela and Ted Lindeman
Helped the development of the synthesis of sequoiatone A, a natural product with some anti-tumor properties, particularly against breast cancer.

Service and Volunteer Activities

2002-2003 **Student Representative to Department Meetings**, *The Colorado College*.
Elected by fellow students to represent their interests at Chemistry Department meetings. Organized student involvement in the hiring of a new professor.

2000-2003 **Kids' Science Day**, *The Colorado College*.
Program to introduce elementary school students to fun parts of science. Helped organize the first annual event, and served as counselor or chemistry/physics demonstrator every year.

1999-2003 **Student Affiliates of the American Chemical Society**, *The Colorado College*.
Served in several roles, including editor of the department newsletter, outreach coordinator, co-coordinator of National Chemistry Week activities, and executive vice president.

Teaching Experience

Fall 2010 **General Chemistry**, *Teaching Assistant*.
Instructors: John Arnold, Angela Stacy, Marcin Majda, and Michelle Douskey (University of California, Berkeley)

Fall 2007 **Advanced Quantum Mechanics**, *Teaching Assistant*.
Instructor: Daniel M. Neumark (University of California, Berkeley)
Graduate-level course taken by most physical chemistry graduate students.

Fall 2006 **Physical Chemistry**, *Teaching Assistant*.
Instructors: William H. Miller and Haw Yang (University of California, Berkeley)
Undergraduate course which introduces chemistry majors to quantum mechanics.

Fall 2005 **General Chemistry**, *Teaching Assistant*.
Instructors: Richard Saykally, Mark Kubinec, and Michelle Douskey (University of California, Berkeley)
Introduction to chemical principles for non-majors.

2003-2004 **English Assistant**, *Lycée Le Corbusier (Illkirch, France)*.
Taught English (as a foreign language) in a French high school focused on construction-related employment. My students ranged from housepainter apprentices to those who planned to become architects and designers.

1999-2003 **Chemistry and Physics Tutor**, *The Colorado College*.
Helped students in lower division chemistry and physics classes with homework and lab reports.