Mark L. Henle
Department of Chemistry and Biochemistry
University of California
P.O. Box 951569
Los Angeles, CA 90095-1569
phone: (310) 794-4355
fax: (310) 206-4038

PERSONAL INFORMATION

Home address: 1020 21st St. Apt. B
Santa Monica, CA 90403
Home phone: (310) 266-7439
E-mail: henle@chem.ucla.edu

EDUCATION

University of California, Santa Barbara, Santa Barbara, CA, 2000 - 2005.

Graduate Student, Department of Physics.
Field of study: *Soft Condensed Matter and Biophysics Theory.*
Advisor: Philip A. Pincus.
M. A. Physics, 2003.
Ph.D. Physics, 2005.
Thesis: *Statics and Correlations of Ions Near Charged Surfaces.*

Brown University, Providence, RI, 1996-2000.

Sc.B. Mathematics-Physics, *Magna Cum Laude.*

AWARDS AND HONORS

National Science Foundation Graduate Research Fellowship, 2002-5.
National Science Foundation.

Outstanding Teaching Assistant Award, 2001.
Department of Physics, University of California, Santa Barbara.

R. Bruce Lindsay Prize for Excellence in Physics, 2000.
Department of Physics, Brown University.

APS LeRoy Apker Award Nominee, 2000.
Department of Physics, Brown University.

Elected to Sigma Xi, 2000.
Brown University.

Elected to Phi Beta Kappa, 1999.
Brown University.

RESEARCH EXPERIENCE

Postdoctoral Researcher, University of California, Los Angeles, 2005-present.

My postdoctoral research focuses on the following problems in soft matter physics:

- Hydrodynamics of membranes and interfaces, including capillary waves on viscoelastic polymer thin-films and the diffusion of particles and extended objects in curved membranes.
- Two-point microrheology of cells on soft substrates.
- Disruption of nucleosomes by linear tension.

Graduate Research Assistant, University of California, Santa Barbara, 2002-2005.

Advisor: Philip Pincus. My graduate research focused on the following problems in theoretical soft condensed matter physics and biophysics:

- Thermodynamics of bundle growth of stiff polyelectrolytes in the presence multi-valent counterions.
- Morphological deformations of polyelectrolyte bundles due to local defects.
- Effects of discrete surface charge on the distribution of counterions around charged macromolecular surfaces.
- Effects of crowding on the diffusion and binding of large particles through a channel.

Graduate Research Assistant, University of California, Santa Barbara, 2001.

Advisor: Glenn Fredrickson. Began work to develop a computational tool that uses the method of finite elements to generate the complete solutions to Maxwell's equations for the scattering of electromagnetic radiation by complex objects.

Undergraduate Research Assistant, Brown University, 1999-2000.

Advisor: Xinsheng Ling. Designed and built the apparatus for and performed experiments on the melting of vortex lattices in high-T_c superconductors.

Undergraduate Research Assistant, University of Illinois at Chicago, Summer 1998.

Advisor: Charles K. Rhodes. Performed experiments using high intensity ultraviolet femtosecond laser pulses.

Undergraduate Research Assistant, University of Illinois at Chicago, Summer 1997.

Advisor: Nigel D. Browning. Combined experimental data with computer modeling to determine the 3-D atomic structure of grain boundaries in semiconductor oxides.

PROFESSIONAL ACTIVITIES

Boulder School for Condensed Matter Physics and Materials Physics, University of Colorado, Boulder, CO, July 2002.

Condensed Matter Reading Group, Department of Physics, University of California, Santa Barbara, 2000-present.

American Physical Society, Member, 2000-present.

Biophysical Society, Member, 2004-present.

CONTRIBUTED TALKS

"Defect-induced morphologies of biopolymer bundles," Amercan Physical Society March Meeting, Baltimore, MD, March 2005.

"Capillary wave dynamics on viscoelastic polymer thin-films: monolayers and bilayers," Amercan Physical Society March Meeting, Baltimore, MD, March 2005.

"Diffusion and binding of finite-size particles through tubes," Amercan Physical Society March Meeting, Los Angeles, CA, March 2005.

"Distribution of counterions near discretely charged rods," American Physical Society March Meeting, Montreal, QC, Canada, March 2004.

"Aggregation of like-charged macromolecules: formation of finite-size bundles," American Physical Society March Meeting, Austin, TX, March 2003.

POSTERS

"Distribution of Counterions near discretely charged rods," Workshop on Nanotechnology, Biotechnology, and Nanostructured Materials, University of California, Santa Barbara, April 2004.

"Distribution of Counterions near discretely charged rods," USCB-Max Planck Institute Workshop on Future Trends in Materials, University of California, Santa Barbara, February 2004.

"Distribution of Counterions near discretely charged rods," National Science Foundation Site Visit Poster Session, University of California, Santa Barbara, February 2004.

"Distribution of Counterions near discretely charged rods," Materials Research Outreach Program Symposium, University of California, Santa Barbara, January 2004.

"Diffusion and binding of finite-size particles through tubes," Biophysical Society Annual Meeting, Long Beach, CA, February 2005.

TALKS

"Thermodynamic stability of polyelectrolyte bundles," University of California, San Diego, March 2005.

"Equilibrium bundle size of rodlike polyelectrolytes with counterion-induced attractive interactions," University of California, Santa Barbara, October 2004.

PUBLICATIONS

M. L. Henle and A. J. Levine, "Capillary wave dynamics on viscoelastic polymer thin-films: monolayers and bilayers," *submitted to Phys. Rev. E.*

M. L. Henle, R. McGorty, A. D. Dinsmore, and A. J. Levine, "Effects of topology and curvature on the hydrodynamics of membranes and interfaces," *in preparation.*

M. L. Henle, A. J. Gopinathan, U. Raviv, and D. J. Needleman, "Defect-induced morphologies of biopolymer bundles," *in preparation.*

C. D. Santangelo, M. L. Henle, and A. Gopinathan, "Diffusion and binding of finite-size particles through tubes," *in preparation.*

M. L. Henle and P. A. Pincus, "Equilibrium bundle size of rodlike polyelectrolytes with counterion-induced attractive interactions", *Phys. Rev. E* **71**, 060801 (2005), cond-mat/0407645.

M.L. Henle, C.D. Santangelo, D.M. Patel, and P. A. Pincus, "Distribution of counterions near discretely charged planes and rods", *Eur. Phys. Lett.* **66**, 284 (2004), cond-mat/0310450.

M. L. Henle, "The Melting of Vortex Matter in Type II Superconductors," *senior thesis published by Brown University Press,* November 2001.

REFERENCES

Professor Alex J. Levine
Department of Chemistry and Biochemistry
University of California
P.O. Box 951569
Los Angeles, CA 90095-1569
E-mail: alevine@chem.ucla.edu

Professor Tom Chou
Department of Biomathematics
University of California
Los Angeles, CA 90095-1766
E-mail: tomchou@ucla.edu

Professor Robijn Bruinsma
Department of Physics and Astronomy
P.O. Box 951547
Los Angeles, CA 90095-1547
E-mail: bruinsma@physics.ucla.edu

Professor Philip A. Pincus
Materials Research Laboratory, Bldg. 2208
University of California
Santa Barbara, CA 93106
E-mail: fyl@mrl.ucsb.edu

Professor Cyrus R. Safinya
Materials Research Laboratory, Bldg. 2208
University of California
Santa Barbara, CA 93106
E-mail: safinya@mrl.ucsb.edu