

Prajnaparamita Dhar

4141-B Learned Hall, Department of Chemical and Petroleum Engineering
University of Kansas, Lawrence, KS 66045.
Email: prajnadhar@ku.edu, prajnadhar@gmail.com
Ph: (785) 864-4969 (office)

Education:

- PhD in Chemistry, April 2008
Dissertation: *Autonomous and guided motion of active components at interfaces*
Advisor: Dr. Thomas Fischer
Florida State University, Tallahassee, FL 32306.
- M.S. in Physics, August 2003
Indian Institute of Technology, Bombay, India
- B.Sc Physics(Honors), August 2001
Calcutta University, WB, India.

Professional Experience:

- Assistant Professor August 2010 – Present
Field of study: Lipid-protein interactions in biological self-assembly
University of Kansas, Lawrence KS-66045.
- Post Doctoral Researcher March 2008 – August 2010
Field of study: Lipid-protein interactions in lung surfactants
Advisor: Dr Joseph Zasadzinski
University of California, Santa Barbara, CA 93106.
- *Graduate Research Assistant* May 2005 – Feb 2008
Advisor: Dr. Thomas Fischer
Florida State University, Tallahassee, FL 32306.
- *Graduate Teaching Assistant* August 2004 – May 2004
Chem1045 Lab
Duties included conducting laboratory classes for freshman chemistry, explaining the experiments, holding office hours and grading laboratory reports.
- *Summer Intern* June 2002 – August 2002
Advisor: Dr. Gautam Buddha Talapatra
Indian Association for the Cultivation of Science, Kolkata, India.

Honors and Awards:

- American Lung Association Senior Research Training Award, 2010.
- Travel Award to the *Gordon Research Conference in Soft Condensed Matter*, August 2009.
- Russell Johnsen Dissertation Award 2007-2008.
Awarded annually to the best dissertation in the FSU Department of Chemistry.
- Selected Student Poster Presentation at the *Gordon Research Conference on Physics and Chemistry of Microfluidics*, 2007.
- Travel Award to the *Gordon Research Conference on Physics and Chemistry of Microfluidics*, 2007.
- Graduated B.Sc. with honors in Physics.

Research Interests:

My research aims at employing recent advances in nanotechnology to obtain a biophysical perspective of the intricate *nanoscale self-assembly* processes. The long term research goals of my laboratory are to advance the field of *Nanomedicine*, by employing a suite of biophysical techniques to (i) develop a thorough understanding of the organization of the cellular architecture at the molecular and cellular level, and (ii) engineer miniature and efficient drug-delivery devices that work synergistically within the human body. In particular, our lab is involved in understanding how ***abnormal or deficient lipid-protein interactions*** can alter the lateral organization of lipid molecules in cell membranes leading to the onset of various diseases.

Publications:

1. S. Aliaskariso, P. Tierno, **P. Dhar**, Z. Khattari, M. Blaszczyński, J. Kohler, and Th. M. Fischer *On the diffusion of circular domains on a spherical vesicle* **J. Fluid Mech.**, 654, 417-451 (2010).
2. **P. Dhar**, Y. Cao, T. Fischer, J. Zasadzinski, *Active Interfacial Microrheology of Aging Protein Films* **Physical Review Letters** 104, 016001-4 (2010).
3. J. A. Zasadzinski, P. C. Stenger, I. Shieh, **P. Dhar**, *Overcoming Rapid Inactivation of Lung Surfactant: Analogies Between Competitive Adsorption and Colloid Stability* Invited Review **BBA:Biomembranes** In Press (2009) (doi:10.1016/j.bbamem.2009.12.010).
4. T. Fischer and **P. Dhar** *Comment on "Osmotic propulsion: The osmotic motor"* **Physical Review Letters**, 102,159801 (2009)[Selected for publication by Virtual Journal of Nanoscale Science and Technology, April 27, 2009 issue].
5. **P. Dhar**, P. Stenger, J. Zasadzinski *Alterations In Phase And Morphology Of A Lung Surfactant Monolayer in contact with surfactant in the sub-phase induced by cholesterol and native surface active proteins* **Biophys. J** 96(3), Supplement 1, 610a-611a (2009)
6. **P. Dhar**, V. Prasad, E. Weeks, T. Bohlein, T. Fischer, *Immersion of nanoparticles at a salt solution air interface* **J. Phys. Chem. B** 112, 9565-9567 (2008).
7. **P. Dhar**, P. Tierno, J. Hare, T. Johansen, T. Fischer, *Curvature driven motion of mouse macrophages in a pulsating magnetic film ratchet* **J. Phys. Chem. B** , 111, 13097-13100(2007).
8. **P. Dhar**, C. Swayne, T. Kline, A. Sen, T. Fischer, *Orientations of over damped magnetic nano-gyroscopes* **Nano Letters**, 7, 1010-1012(2007).
9. **P. Dhar**, Y. Cao, T. Kline, P. Pal , C. Swanye, T. Fischer, B Miller, T. Mallouk, A Sen, T Johansen *Autonomously moving Local Nanoprobes in Heterogeneous Magnetic Fields* **J. Phys. Chem. C**, 111, 3607-3613(2007).
10. **P. Dhar** Th. M. Fischer, Y. Wang, T. E. Mallouk, W. E. Paxton and A. Sen, *Autonomously moving nanorods at a viscous interface*, **Nano Letters** 6(1), 66-72(2006).
11. Th. M. Fischer, **P. Dhar**, Peter Heinig, *The viscous drag of sphere and filaments moving in membranes or monolayer* , **J. Fluid Mech.** .558, 451-475(2006).
12. A. Singha, **P. Dhar**, and A. Roy, *A nondestructive tool for nanomaterials: Raman and photoluminescence spectroscopy* **Am J. Physics**, 73(3), 224-233(2005).

Preprints Available upon request

1. **P. Dhar**, Vy Nguyen, Alan Waring, J. Zasadzinski, *Beneficial effects of cholesterol on the biophysical function of a protein deficient clinical pulmonary surfactant.* to be Submitted to **Biophysical Journal**(2010).
2. **P. Dhar**, Elizabeth Eck, Alan Waring, J. Zasadzinski, *Effect of hydrophobic surfactant proteins SP-B and SP-C on the phase and morphology of protein deficient native surfactant films.* to be Submitted to **Biophysical Journal**(2010).

Seminars and Conferences:

1. Oral Presentation *Surface Aging in serum* at the **Society of Rheology Annual Meeting, 2010**, Oct 25th, 2010.
2. Invited talk *Beneficial Role of Cholesterol on Lung Surfactant Function* at the Bioengineering Colloquium, Sept 10th, 2010.
3. Oral Presentation *Effect of hydrophobic surfactant proteins SP-B and SP-C on the phase and morphology of protein deficient native surfactant films* at the **American Institute of Chemical Engineers Annual Meeting 2009**, November 12th, 2009
4. Oral Presentation *Active Interfacial Microrheology of Aging Protein Films* at the **American Institute of Chemical Engineers Annual Meeting 2009**, November 9th, 2009
5. Poster Presentation *Nanobiotechnology: Fundamental Physical Studies of Biological and Engineered Soft Matter for Applications in Nanomedicine* at the *Meet the faculty Candidate Session* at the **American Institute of Chemical Engineers Annual Meeting 2009**, November 8th, 2009
6. Poster Presentation *Active Interfacial Microrheology of Aging Protein Films* at the **Gordon Research Conference-Soft Condensed Matter Physics**, August 9-14, 2009.
7. Poster Presentation *Alterations In Phase And Morphology Of A Lung Surfactant Monolayer in contact with surfactant in the sub-phase induced by cholesterol and native surface active proteins* at the **Biophysical Society Meeting**, March 4, 2009.
8. Oral Presentation, *Protrusion of a Charged Sphere at air/water interface*, at the **International Committee on Rheology Meeting**, August 4, 2008.

9. Oral Presentation, *Immersion of Nanoparticles at a salt water/air interface*, at the **82nd ACS Colloids and Interfaces Meeting**, June 16, 2008.
10. Invited Talk, *Autonomous motion of active components at interfaces*, at the **Non Linear Dynamics Group, Department of Physics, Universität Bayreuth, Germany**, November 6, 2007.
11. Oral Presentation, *Microfluidics in channels without walls*, at the **Gordon Research Conference**, Physics & Chemistry Of Microfluidics, July 19, 2007.
12. Oral Presentation, *Autonomously moving Local Nanoprobes in Heterogeneous Magnetic Fields*, at the **Florida Annual Meeting and Exposition of the American Chemical Society (FAME)**, May 11, 2007.
13. Oral Presentation, *Autonomously moving Local Nanoprobes in Heterogeneous Magnetic Fields*, at the **Materials Research Society Spring Meeting**, April 13, 2007.
14. Oral Presentation, *Autonomous motion of Nanorods at a Viscous Interface*, at the **Florida Annual Meeting and Exposition of the American Chemical Society (FAME)**, May 12, 2006.

Outreach Activities:

- Volunteer for **Global Educational Outreach Program** started by *Sir Harry Kroto*. Presentation and interview available on the web at
<http://www.geoset.info/projectsgrad.html>: Motion at Interfaces, Prajna Dhar
<http://www.geoset.info/swa.html>: Episode 1.
- Mentor for **Internships in Nanosystems Science, Engineering and Technology (INSET) program**, which attracts community college undergraduates to the University of California, Santa Barbara campus.
- Mentor for **Santa Barbara Community College Work Experience Program Course 290**
- Volunteer for **Chemistry Outreach Program**, for developing interests in Chemistry as a subject for higher studies among high school students in Leon County, Florida, 2006–2008.
- Physical Chemistry Representative for *Faculty–Student Relations Committee*, Summer 2007–Spring 2008.
- *Judge, Florida Regional Science Fair*, February 2005, 2007.