

October 5, 2010

Curriculum Vitae
Corey S. O'Hern

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Citizenship: USA

Positions Held

2006 – Present Associate Professor, Department of Mechanical Engineering and
Department of Physics, Yale University
2002 – 2006 Assistant Professor, Department of Mechanical Engineering and
Department of Physics, Yale University
1999 – 2002 Postdoctoral Research Associate, James Franck Institute, University of Chicago
1999 – 2002 Postdoctoral Research Associate, Department of Chemistry & Biochemistry,
University of California, Los Angeles

Education

1999 Ph.D., University of Pennsylvania (Physics)
Thesis: “Elasticity Theories for Cationic Lipid and DNA Complexes”
Thesis advisor: Professor Tom Lubensky
1994 B.S., Duke University (Physics)
Thesis: “Characteristic Length and Time Scales for Nonequilibrium Systems”
Thesis advisors: Professors Bob Behringer and Henry Greenside

Research Interests

Granular materials: shear flows, random close packing, force chains.
Statistical mechanics of nonequilibrium systems
Glass and Jamming Transitions: slow dynamics and collective motions in amorphous materials.
Protein structure, interactions, and dynamics: folding, unfolding, binding, and aggregation.
Active materials: cell migration and packing.

Awards and Honors

2008-2012 NSF Cyber-Enabled Discovery and Innovation Award
2005-2010 NSF Faculty Early Career Development Award
2002 Finalist, University of California Chancellor's Award for Postdoctoral Research
1999 Granted National Research Council Postdoctoral Research Associateship at the
Center for Bio/Molecular Science and Engineering, Naval Research Laboratory,
Washington, DC (declined)
1994 Graduated *summa cum laude* and with highest distinction in Physics from
Duke University
1994 Inducted into *Phi Beta Kappa*, Duke University

Journal Articles

1. C. F. Schreck, T. Bertrand, C. S. O'Hern, and M. D. Shattuck, "Jammed particulate systems are inherently nonharmonic," submitted to *Phys. Rev. Lett.* (2010); xxx.lanl.gov/abs/1008.4804
2. J.-K. Yang, C. F. Schreck, H. Noh, S.-F. Liew, C. S. O'Hern, and H. Cao, "Photonic band gap effects in two-dimensional polycrystalline and amorphous structures," submitted to *Phys. Rev. A* (2010); xxx.lanl.gov/abs/1008.4804
3. C. F. Schreck, C. S. O'Hern, and L. E. Silbert, "Tuning frictionless disk packings from isostatic to hyperstatic," submitted to *Phys. Rev. E* (2010); xxx.lanl.gov/abs/1007.2162
4. R. S. Hoy and C. S. O'Hern, "Minimal energy packings and collapse of sticky tangent hard-sphere polymers," *Phys. Rev. Lett.* 105 (2010) 068001; xxx.lanl.gov/abs/1003.6763
5. R. S. Hoy and C. S. O'Hern, "Viscoplasticity and large-scale chain relaxation in glassy-polymeric strain hardening," *Phys. Rev. E* 82 (2010) 041803; xxx.lanl.gov/abs/1004.0410
6. C. F. Schreck, N. Xu, and C. S. O'Hern, "A comparison of jamming behavior in systems composed of dimer- and ellipse-shaped particles," *Soft Matter* 6 (2010) 2960; xxx.lanl.gov/abs/1001.2858
7. J. D. Forster, H. Noh, S. F. Liew, L. Yang, J.-G. Park, R. O. Prum, C. S. O'Hern, S. G. J. Mochrie, H. Cao, and E. R. Dufresne, "Biomimetic isotropic nanostructures for structural coloration," *Advanced Materials* 22 (2010) 2939; xxx.lanl.gov/abs/0909.0636
8. G.-J. Gao, J. Blawdziewicz, and C. S. O'Hern, "Geometrical families of mechanically stable granular packings," *Phys. Rev. E* 80 (2009) 061303; xxx.lanl.gov/abs/0909.0636.
9. G. Lois, J. Blawdziewicz, and C. S. O'Hern, "Protein folding on rugged energy landscapes: Conformational diffusion on fractal networks," *Phys. Rev. E* 81 (2010) 051907; xxx.lanl.gov/abs/0906.4385.
10. G. Lois, J. Xie, T. Majmudar, S. Henkes, B. Chakraborty, C. S. O'Hern, and R. P. Behringer, "Stress correlations in granular materials: An entropic formulation," *Phys. Rev. E* 80 (2009) 060303(R); xxx.lanl.gov/abs/0906.0056.
11. G.-J. Gao, J. Blawdziewicz, C. S. O'Hern, and M. Shattuck, "Experimental demonstration of nonuniform frequency distributions of mechanically stable granular packings", *Phys. Rev. E* 80 (2009) 061304; xxx.lanl.gov/abs/0903.4941.
12. M. Mailman, C. Schreck, C. S. O'Hern, and B. Chakraborty, "Jamming in Systems Composed of Ellipse-Shaped Particles", *Phys. Rev. Lett.* 102 (2009) 255501; xxx.lanl.gov/abs/0812.1234.
13. G. Lois, J. Blawdziewicz, and C. S. O'Hern, "A percolation model for glassy dynamics in disordered materials", *Phys. Rev. Lett.* 102 (2009) 015702; xxx.lanl.gov/abs/0809.1044.
14. M. Lundberg, K. Krishan, N. Xu, C. S. O'Hern, and M. Dennin, "Comparison of low amplitude oscillatory shear in experimental and computational studies of model foams", *Phys. Rev. E* 79 (2009) 041405; xxx.lanl.gov/abs/0807.4743.

15. P. Pal, J. Blawdziewicz, E. R. Dufresne, C. S. O'Hern, and R. Stinchcombe, "A minimal model for kinetic arrest", *Phys. Rev. E* **78** (2008) 011111; xxx.lanl.gov/abs/0804.2060.
16. G. Lois, J. Blawdziewicz, and C. S. O'Hern, "Reliable protein folding on non-funneled energy landscapes: The free energy reaction path," *Biophys. J.* **95** (2008) 2692; xxx.lanl.gov/abs/0802.0209.
17. G. Lois, J. Blawdziewicz, and C. S. O'Hern, "The jamming transition and new percolation universality classes in particulate systems with attraction," *Phys. Rev. Lett.* **100** (2007) 028001; xxx.lanl.gov/abs/0708.1961.
18. M. Lundberg, K. Krishan, N. Xu, C. S. O'Hern, and M. Dennin, "Reversible plasticity in amorphous materials", *Phys. Rev. E* **77** (2008) 041505; xxx.lanl.gov/abs/0707.4014.
19. A. L. Cortajarena, G. Lois, E. Sherman, C. S. O'Hern, L. Regan, and G. Haran, "Non-random-coil behavior as a consequence of extensive PPII Structure in the denatured state," *J. Mol. Biol.* **382** (2008) 203; xxx.lanl.gov/abs/0807.4765.
20. S. Henkes, C. S. O'Hern, and B. Chakraborty, "Entropy and Temperature of a Static Granular Assembly: An *ab initio* approach," *Phys. Rev. Lett.* **99** (2007) 038002; xxx.lanl.gov/cond-mat/0701489.
21. G.-J. Gao, J. Blawdziewicz, and C. S. O'Hern, "Studies of the Frequency Distribution of Mechanically Stable Disk Packings," *Phys. Rev. E* **74** (2006) 061304; xxx.lanl.gov/cond-mat/0606224.
22. G.-J. Gao, J. Blawdziewicz, and C. S. O'Hern, "Enumeration of distinct mechanically stable disk packings in small systems," *Phil. Mag.* **87** (2007) 425; xxx.lanl.gov/cond-mat/0605009.
23. N. Xu and C. S. O'Hern, "Measurements of the yield stress in frictionless granular systems," *Phys. Rev. E* **73** (2006) 061303.
24. N. Xu, C. S. O'Hern, and L. Kondic, "Stabilization of nonlinear velocity profiles in athermal systems undergoing planar shear flow," *Phys. Rev. E* **72** (2005) 041504.
25. N. Xu, J. Blawdziewicz, and C. S. O'Hern, "Reexamination of random close packing: Ways to pack frictionless disks," *Phys. Rev. E* **71** (2005) 061306.
26. N. Xu and C. S. O'Hern, "Effective temperature in athermal systems sheared at fixed normal load," *Phys. Rev. Lett.* **94** (2005) 055701.
27. N. Xu, C. S. O'Hern, and L. Kondic, "Velocity profiles in repulsive athermal systems under shear," *Phys. Rev. Lett.* **94** (2005) 016001.
28. C. S. O'Hern, A. J. Liu, and S. R. Nagel, "Effective temperatures in driven systems: Static vs. time-dependent relations," *Phys. Rev. Lett.* **93** (2004) 165702.
29. C. S. O'Hern, L. E. Silbert, A. J. Liu, and S. R. Nagel, "Jamming at zero temperature and zero applied stress: The epitome of disorder," *Phys. Rev. E* **68** (2003) 011306.
30. I. K. Ono, C.S. O'Hern, D. J. Durian, S. A. Langer, A. J. Liu, and S. R. Nagel, "Effective temperatures of a driven system near jamming," *Phys. Rev. Lett.* **89** (2002) 095703.

31. C.S. O'Hern, S. A. Langer, A. J. Liu, and S. R. Nagel, "Random packings of frictionless particles," *Phys. Rev. Lett.* **88** (2002) 075507.
32. C.S. O'Hern, S. A. Langer, A. J. Liu, and S. R. Nagel, "Force distributions near the jamming and glass transitions," *Phys. Rev. Lett.* **86** (2001) 111.
33. L. Golubović, T. C. Lubensky, and C. S. O'Hern, "Structural properties of the sliding columnar phase in layered liquid crystalline systems," *Phys. Rev. E* **62** (2000) 1069.
34. C. S. O'Hern, T. C. Lubensky, and J. Toner, "Sliding phases in x-y models, crystals, and cationic lipid-DNA complexes," *Phys. Rev. Lett.* **83** (1999) 2745.
35. C. S. O'Hern and T. C. Lubensky, "Sliding columnar phase of DNA-lipid complexes," *Phys. Rev. Lett.* **80** (1998) 4345.
36. C. S. O'Hern and T. C. Lubensky, "Nonlinear elasticity theory of the sliding columnar phase," *Phys. Rev. E* **58** (1998) 5948.
37. C. S. O'Hern, R. D. Kamien, T. C. Lubensky, and P. Nelson, "Elasticity theory of a twisted stack of plates," *Eur. Phys. J. B* **1** (1998) 95.
38. R. D. Kamien, T. C. Lubensky, C. S. O'Hern, and P. Nelson, "Direct determination of DNA twist-stretch coupling," *Europhys. Lett.* **38** (1997) 237.
39. C. S. O'Hern, D. A. Egolf, and H. S. Greenside, "Lyapunov spectral analysis of a nonequilibrium Ising-like transition," *Phys. Rev. E* **53** (1996) 3374.
40. Brian Miller, C. O'Hern, and R. P. Behringer, "Stress fluctuations for continuously sheared granular materials," *Phys. Rev. Lett.* **77** (1996) 3110.

Conference Proceedings

1. G. Lois, J. Blawdziewicz, and C. S. O'Hern, "Jamming in attractive granular media", *Proceedings in Applied Mathematics and Mechanics* **7** (2007) 1090605.
2. L. Kondic, C. S. O'Hern, and R. P. Behringer, "Dense Granular Systems: From Theory to Applications", *SIAM News* **40** (2007) 13.
3. G.-J. Gao, J. Blawdziewicz, and C. S. O'Hern, "Testing the equal-probability assumption for jammed particle packings," *Reports of the Institute of Fluid Science, Tohoku University* **19** (2007) 23.
4. N. Xu and C. S. O'Hern, "Effective temperatures in repulsive glasses sheared at fixed normal load," *Powders and Grains*, eds. R. Garcia-Rojo, H. J. Hermann, and S. McNamara, (A. A. Balkema, Leiden, 2005).
5. C. S. O'Hern, S. A. Langer, A. J. Liu, and S. R. Nagel, "Jamming in liquids and granular materials," *Materials Research Society Proceedings, The Granular State*, **627** (2000).
6. C. S. O'Hern, R. D. Kamien, T. C. Lubensky, and P. Nelson, "Twist-stretch elasticity of DNA," *Materials Research Society Proceedings, Statistical Mechanics in Physics and Biology*, **463** (1997).

Book Chapters

1. C. F. Schreck and C. S. O'Hern, "Computational Methods to Study Jammed Systems", in *Experimental and Computational Techniques in Soft Condensed Matter Physics*, ed. by J. S. Olafsen (Cambridge University Press, New York 2009).
<http://www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521115902>

Recent Invited Presentations

- **Invited Lecturer**, Summer School on Granular Flows, University of Maryland, (June 14-15, 2011)
- **Invited Speaker**, Dynamics Days, Chapel Hill, NC (January 5-8, 2011)
- **Invited Speaker**, Recent Progress in the Physics of Dissipative Particles, Yukawa Institute of Theoretical Physics, Kyoto University, (November 24-26, 2010)
- **Invited Speaker**, New England Workshop on Mechanics of Materials and Structures, Harvard University (September 25, 2010)
- **Invited Speaker**, Particulate Materials in Extreme Environments, Lawrence Livermore National Laboratory (September 22, 2010)
- **Invited Speaker**, Conference on "Particulate Matter: Does Dimension Matter?," Max Planck Institute for the Physics of Complex Systems, (May 31-June 4, 2010).
- **Invited Speaker**, Mini-symposium on "Mesoscopic Self Assembly," SIAM Conference on Mathematical Aspects of Materials Science, (May 23-26, 2010).
- **Invited Speaker**, Special Session, "Topological and Computational Dynamics," American Mathematical Society Eastern Section Meeting, (May 22-23, 2010).
- **Invited Speaker**, Special Session, "Dense Packings of Non-spherical Particles," 25th annual Shanks Conference, "Optimal Configurations on the Sphere and Other Manifolds," (May 17-20, 2010).
- **Invited Participant**, Kavali Institute for Theoretical Physics Program on The Physics of Glasses, (May 2010).
- **Invited Speaker**, TCG-XI Penetration Meeting, Defense Threat Reduction Agency, Picatinny Arsenal (April 8, 2010)
- **Invited Speaker**, DARPA Workshop on Granular Science, (February 17-18, 2010)
- **Invited Speaker**, Special Session, "Gels, Glasses, and Jammed Systems," 81st Annual Meeting of the Society of Rheology (October 2009).
- **Invited Speaker**, Minisymposium, "Force chain fluctuations and jamming in dense granular flows," 7th EUROMECH Solid Mechanics Conference, (September 2009).
- **Invited Speaker**, Symposium on Defects and Microstructure at the Nanoscale and Beyond, 10th US National Congress on Computational Mechanics (July 2009).

- **Invited Speaker**, Workshop on the Statistical Mechanics of Static Granular Media, Lorentz Center, Leiden University (July 2009).
- Symposium on Local Structure and Dynamics in Amorphous Systems, 2008 Materials Research Society Fall Meeting (December 2008).
- **Invited Speaker**, Complex Fluids Symposium, 45th Annual Meeting, Society of Engineering Science, University of Illinois at Urbana- Champaign (October 2008).
- **Invited Speaker**, Workshop on Dynamical Heterogeneities in Glasses, Colloids, and Granular Media, Lorentz Center, Leiden University (August 2008).
- **Invited Participant**, Aspen Center for Physics Summer Program on Complexity, Disorder, and Algorithms (June 2008).
- **Invited Speaker**, Workshop on Crystallization and Jamming in Soft Matter under Driving, Lorentz Center, Leiden University (February 2008).
- **Invited Speaker**, Society for Industrial and Applied Mathematics Conference on Mathematics for Industry: Challenges and Frontiers, Philadelphia, PA (October 2007).
- **Invited Participant**, Aspen Center for Physics Summer Program on Jamming (July 2007).
- **Invited Speaker**, 6th International Congress on Industrial and Applied Mathematics, ETH, Zurich (July 2007).
- **Invited Speaker**, 4th International Workshop in Complex Systems, Tohoku University, Sendai, Japan (January 2007).
- **Invited Speaker**, 8th Greater Boston Area Statistical Mechanics Meeting, Brandeis University (October 2006).
- **Invited Speaker**, Gordon Research Conference on Granular Flow, Queen's College, Oxford, England (July 2006).
- **Invited Speaker**, mini-symposium on "The mechanics of new materials for everyday life," 15th US National Conference on Theoretical and Applied Mechanics, University of Colorado-Boulder (June 2006).
- **Invited Speaker**, *26th Complex Fluids Workshop*, Yale University (March 2006).
- **Invited Speaker**, *10th International Workshop on Disordered Systems*, Molveno, Italy (March 2006).
- **Invited Speaker**, *Powders and Grains 2005*, Institute for Computational Physics, University of Stuttgart (July 2005).
- **Invited Speaker**, *3rd New England Granular Materials Workshop*, held at Wesleyan University (June 2005).
- **Invited Speaker**, Granular Physics Program, Kavali Institute for Theoretical Physics, University of California, Santa Barbara (June 2005).
- **Invited Speaker**, American Physical Society March Meeting, Invited Session on Jamming, Los Angeles, CA (March 2005).

- **Lecturer**, Tutorial on “Jamming in Soft-Condensed Matter Physics”, American Physical Society March Meeting, Los Angeles, CA (March 2005).
- **Invited Speaker**, American Physical Society March Meeting, Invited Session on Effective Temperatures in Driven Systems, Austin, TX (March 2003).
- **Invited Speaker**, *9th International Workshop on Disordered Systems*, Molveno, Italy (June 2002).

Selected Seminars and Colloquia

- **Seminar**, Mechanical, Industrial, and Systems Engineering Department, University of Rhode Island (November, 2010).
- **Colloquium**, Department of Mechanical and Aerospace Engineering, University of Florida (October, 2010).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics and Astronomy, University of Pennsylvania (October, 2010).
- **Colloquium**, Center for Nonlinear Studies, Los Alamos National Laboratory (April, 2010).
- **Seminar**, Condensed Matter Seminar, Department of Physics and Astronomy, Johns Hopkins University (March 2010).
- **Colloquium**, Department of Physics, Emory University (January, 2010).
- **Seminar**, Soft Matter Seminar, Department of Physics, Georgetown University (November 2009).
- **Seminar**, Department of Chemical Engineering, Pennsylvania State University (October 2009).
- **Seminar**, Department of Applied Mathematics, Harvard University (May 2009).
- **Seminar**, Benjamin Levich Institute for Physico-Chemical Hydrodynamics, City College of CUNY (April 2009).
- **Seminar**, Institute for Nanoscience and Quantum Engineering, Yale University (February 2009).
- **Colloquium**, Department of Physics, Rochester Institute of Technology (December 2008).
- **Seminar**, Single Molecule Discussion Group, Department of Molecular Biochemistry and Biophysics, Yale University (December 2008).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics, University of Massachusetts-Amherst (November 2008).
- **Seminar**, Condensed Matter Physics Seminar, Syracuse University (November 2007).
- **Seminar**, School of Materials Science and Engineering, Georgia Institute of Technology (November 2007).
- **Seminar**, Chemical Engineering Seminar, Case Western Reserve University (October 2007).

- **Seminar**, Institute for Nanoscience and Quantum Engineering Seminar, Yale University (October 2007).
- **Seminar**, Nonlinear Dynamics Seminar, Physics Department, University of Texas at Austin (September 2007).
- **Colloquium**, Department of Engineering Sciences and Applied Mathematics, Northwestern University (May 2007).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics, Boston University (February 2007).
- **Seminar**, Computations in Science Seminar, Department of Physics, The University of Chicago (November 2006).
- **Seminar**, Complex Materials Theory Group, Department of Chemistry, Princeton University (August 2005).
- **Seminar**, Theory Department, Max Planck Institute for Polymer Research, Mainz, Germany (July 2005).
- **Seminar**, Squishy Physics Seminar, Department of Engineering and Applied Sciences, Harvard University (June 2005).
- **Colloquium**, Department of Applied Mathematics, Massachusetts Institute of Technology (November 2004).
- **Seminar**, Center for Scientific Computation and Mathematical Modeling, University of Maryland (November 2004).
- **Colloquium**, Department of Physics, Wesleyan University (February 2004).
- **Colloquium**, Department of Applied Physics and Applied Mathematics, Columbia University (November 2003).
- **Colloquium**, Department of Applied Mathematics, New Jersey Institute of Technology (October 2003).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics, University of Massachusetts-Amherst (June 2003).
- **Seminar**, Statistical Physics Seminar, Institute for Physical Science and Technology, University of Maryland (April 2003).
- **Seminar**, Department of Physics, Brandeis University (December 2002).
- **Seminar**, Center for Systems Science, Department of Electrical Engineering, Yale University (November 2002).
- **Colloquium**, Department of Physics, Georgetown University (November 2002).
- **Colloquium**, Department of Physics, Clark University (October 2002).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics, Yale University (September 2002).

- **Seminar**, Division of Materials and Process Computation, Sandia National Lab (February 2002).
- **Seminar**, Condensed Matter Physics Seminar, Department of Physics, University of Wisconsin-Madison (February 2002).

Current Support

- NSF DMR-1006537; *Jamming and Glassy Behavior in Systems with Nonspherical Particles and Constrained by Chain Connectivity*; \$270,000; 9/01/10-8/31/13.
- DTRA BRBAA08-H-2-0108; *Microstructure, Fluidization and Control of Penetrator Trajectories in Granular Media*; \$410,407; 4/1/10-3/31/15.
- NSF PHY-1019147; *Collaborative Research: PoLS Student Research Network*; \$584,000; 7/15/10-6/14/15.
- NSF CBET-0967262; *Collaborative Research: Experiment, Simulation, and Theory of Slowly Driven Granular Materials—From Microstate Statistics to Macroscopic Properties*; \$205,342; 4/01/10-3/31/13.
- NSF DMS-0835742; *CDI-Type II: Collaborative Research: Computational Homology, Jamming, and Force Chains in Dense Granular Flows*; \$1,900,000; 10/01/08-9/30/12.
- Raymond and Beverly Sackler Institute for Biological, Physical, and Engineering Sciences Seed Project; *Using proteins to create ‘smart’, stimuli-responsive nano-materials*; \$40,000; 11/01/09-10/31/10.
- Raymond and Beverly Sackler Institute for Biological, Physical, and Engineering Sciences Seed Project; *The role of curvature in α -synuclein binding to lipid bilayers*; \$40,000; 11/01/09-10/31/10.

Prior Support

- NSF Career Award; DMR-0448838; *Career: Computer Simulations of Glassy and Athermal Systems*; \$400,000; 4/01/05-3/31/10.
- NSF CBET-0908238; *Force Chain Fluctuations and Jamming in Dense Granular Flows*; \$12,950; 6/01/09-5/31/10.
- NSF CTS-0456703; *Collaborative Research: Studies of Aging and Memory in Granular Materials*; \$40,000; 8/01/05-7/31/06; REU supplement \$6,000.
- NSF CTS-0625149; *Collaborative Research: Visualization of the Aging Process in Granular Matter using Experiment and Simulation*; \$130,000; 9/01/06-8/31/08. REU Supplement \$7,000.
- Yale Institute for Nanoscience and Quantum Engineering Seed Project; *Coordinated Simulations and Experiments to Predict the Dynamics of Protein Folding from the Amino Acid Sequence*; \$60,000; 8/15/07-8/14/08.
- Yale Institute for Nanoscience and Quantum Engineering Seed Project; *Using Theory, Simulation, and Experiment to Design and Build Structure-seeking Nano- and Bio-materials*; \$55,000; 9/15/08-9/14/09.

Teaching

- **CBB752b**, (Spring 2010, Spring 2011) (0.3) *Bioinformatics: Practical Application of Simulation and Data* (Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine learning approaches for data integration.)
- **ENAS991b/MB&B591b**, (Spring 2010) (0.5) *Integrated Workshop* (A laboratory course involving hands-on modules with students working in pairs. A biological student will be paired with a physics or engineering student; a computation/theory student will be paired with an experimental student. The modules are devised so that a range of skills are acquired, and students learn from each other.)
- **MB&B517/ENAS517a**, (Fall 2009, Fall 2010) *Methods & Logic in Interdisciplinary Research* An intensive seminar-style class in which two professors with complimentary expertise (for example, expertise in physical versus biological systems or theory versus experiment) meet with students to dissect and analyze hallmark papers from the literature.
- **MB&B635a/ENAS518a**, (Fall 2009, Fall 2010) (0.3) *Mathematical Methods in Biophysics* (Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data. Statistics and error analysis, differential equations, linear algebra, and Fourier transforms. Analysis of real data from research groups in MB&B and IGPPEB.).
- **PHY628b/ENAS849b**, (Spring 2007) *Statistical Physics II* (statistical formulation of thermodynamics, review of canonical and grand canonical ensembles, review of phase transitions and critical phenomena, and introduction to renormalization group).
- **ENAS 500a**, (Fall 2006) *Mathematical Methods I* (vector analysis, linear algebra, complex analysis, Fourier integrals and Laplace transforms).
- **MENG 383b**, (Spring 2005, Fall 2007, Fall 2009, Fall 2010) *Mechanical Engineering III: Dynamics* (kinematics and dynamics of rigid bodies, energy and momentum methods, vibrations).
- **ENAS 130b**, (Spring 2003, Spring 2004, Spring 2008, Spring 2011) *Introduction to Computing for Engineers and Scientists* (computer programming in Fortran, C++, and Mathematica using examples from numerical methods, data analysis, database management, and visualization).
- **ENAS 705a**, (Fall 2003, Fall 2004) *Numerical Simulations of Liquids* (statistical mechanics of liquids, molecular dynamics simulations, nonequilibrium conditions, e.g. shear and heat flow, linear response theory, Monte Carlo simulations)
- Research mentor to many Yale undergraduates, Matthew Barber (Physics, 2009), Erik Brown (Physics, 2005), Jonathan Hartman (Mechanical Engineering, 2009), Alan Hutchinson (Physics, 2011), Matthew Kremer (Applied Physics, 2011), Dominic Kwok

(Mechanical Engineering, 2013), Sarah Penrose from Connecticut College (Chemistry, 2013), Ian Rose (Physics, 2009) (Perspectives on Science), Saranya Sethuraman (Applied Math, 2011), Ajay Shalwala (Chemical Engineering, 2005) Rebecca Taft (Physics, 2008), Phillippa Thomson (Mechanical Engineering, 2006), Michael Weiner (Physics, 2011), Amy Werner-Allen (Applied Math, 2011), Alexandra Witthoft from Mount Holyoke College (Physics, 2009) (Yale Summer Undergraduate Research Fellowship), and Christopher Yerino (Physics, 2006) .

- Faculty discussant for Perspectives on Science (2007-2008), which is a discussion course for first-year Yale College students with exceptional abilities in science, math, and engineering.
- Ph.D. thesis advisor for six students: Ning Xu (Mechanical Engineering, 2005), Prasanta Pal (Applied Physics, 2009), Guo-Jie Gao (Mechanical Engineering, 2009), Carl Schreck (Physics, 2012), Tianqi Shen (Physics, 2014), and Qinhua Zhou (Molecular Biophysics & Biochemistry, 2015).
- Ph.D. thesis committee member for Sukalyan Bhattacharya (Mechanical Engineering, 2005), David Dewitt (Molecular Biophysics & Biochemistry, 2013), Brian Dunnican (Molecular Biophysics & Biochemistry, 2015), Seth Dworkin (Mechanical Engineering, 2009), Jason Forster (Mechanical Engineering, 2010), Samuel Flores (Physics, Yale, 2007), Silke Henkes (Physics, Brandeis University, 2008), Nidhi Khurana (Mechanical Engineering, 2011), Xinhui Lu (Physics, Yale, 2009), Mitch Mailman (Physics, Brandeis University, 2012), Jason Merrill (Physics, 2012), Baran Sarac (Mechanical Engineering, 2013), Cecile Mejean (Mechanical Engineering, 2011), Ye Xu (Mechanical Engineering, 2012), Hongqiang Wang (Physics, UMass-Amherst, 2009), Nian Zhang (Mechanical Engineering, 2005), Lin Zhou (Mechanical Engineering, 2006).
- Postdoctoral advisor for Dr. Gregg Lois from Department of Physics, University of California, Santa Barbara, 2006-2009, Dr. Robert Hoy from Department of Physics and Astronomy, Johns Hopkins University, 2009-present, Dr. S. S. Ashwin from Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, 2009-present, and Dr. Vijay Murthy from the Indian Institute of Science, Bangalore, 2010-present.
- Advisor for VAR students: Thibault Bertrand (Ecole Normal Supérieure Cachan, M.S. Physics, 4/15/2010 - 8/15/2010), Katja Schaefer (Mississippi State University, Ph.D. Physics, 2/2009 - 8/2009), Gili Zilberman (University of Haifa, M.S. Biology, 10/2009 - 10/2010).

Professional Activities

- Co-organizer, Biophysical Society Thematic Meeting, “Dynamic DNA Packaging across Kingdoms,” Asilomar, Pacific Grove, CA (July 5-8, 2011).
- Co-organizer, Workshop, “Fluctuations and Response in Granular Materials” Aspen Center for Physics (May 22 - June 12, 2011).
- Co-organizer, Workshop, “Fluctuations and Response in Active Materials: From Driven Granular Systems to Swarming Bacteria” Lorentz Center, Leiden University (June 20-24, 2011).

- Organizer, DARPA Workshop, “The Physics of Accelerating Skin Recovery,” (August 12-13, 2010)
- Co-organizer, *42nd New England Complex Fluids Workshop*, held at Yale University (March 2010).
- Organizer, Focus Session, “Jamming: Theory and Experiment”, American Physical Society March Meeting, Portland, OR (March 2010).
- Hosted sabbatical visits for Prof. March Shattuck, Physics Department, City College of New York (October, 2007 - May 2008) and Prof. Bulbul Chakraborty, Physics, Brandeis University (January, 2011 - May, 2011)
- Organizer, Flint Visitors Fund Lecture Series on Soft Matter and Biological Physics by Prof. Bulbul Chakraborty, Yale University (October 2010).
- Vice-chair of the Topical Group on Statistical and Nonlinear Physics of the American Physical Society (2008-present)
- Session co-Chair, “Gels, Glasses, and Jammed Systems,” 81st Annual Meeting of the Society of Rheology (October 2009).
- Co-organizer, Minisymposium, “Force chain fluctuations and jamming in dense granular flows,” 7th EUROMECH Solid Mechanics Conference (September 2009).
- Organizer, *7th Northeastern Granular Materials Workshop*, held at Yale University (June 2009).
- Co-Organizer, Focus Session, “Polymer Collapse and Protein Folding”, American Physical Society March Meeting, New Orleans, LA (March 2008).
- Co-organizer, *30th New England Complex Fluids Workshop*, held at Yale University (March 2007).
- Co-Organizer, Boulder School for Condensed Matter and Materials Physics, “Physics of Soft Matter: Complex Fluids and Biological Materials” (July 2006).
- Co-Organizer, Focus Session, “Jamming in Glasses, Grains, and Gels”, American Physical Society March Meeting, Baltimore, MD (March 2006).
- Organizer, Focus Session, “Jamming: Rheology and Failure”, American Physical Society March Meeting, Los Angeles, CA (March 2005).
- Organizer, *2nd Northeastern Granular Materials Workshop*, held at Yale University (June 2004).
- Co-organizer, *15th New England Complex Fluids Workshop*, held at Yale University (June 2003).
- Panelist for 2007 NSF Graduate Research Fellowship Program; Panelist for grant proposals submitted to National Science Foundation, Chemical and Transport Systems (March 2003).

- Referee for *Biophysical Journal*, *Chemical Engineering Science*, *Chemical Physics Letters*, Department of Energy: Basic Energy Sciences, *European Physical Journal E*, *Europhysics Letters*, French National Research Agency, Georgia National Science Foundation, *Journal of Chemical Physics*, *Journal of Physical Chemistry B*, *Journal of Physics: Condensed Matter*, *Journal of Physics A: Mathematical and General*, *Journal of Physics D: Applied Physics*, *Journal of Rheology*, *Journal of Statistical Mechanics*, Lawrence Livermore National Lab, *Macromolecules*, *Modeling and Simulation in Materials Science and Engineering*, *Molecular Simulation*, National Science Foundation, National Science Foundation Graduate Research Fellowship Program, *Nature Physics*, National Sciences and Engineering Research Council of Canada, Netherlands Foundation for Fundamental Research on Matter, Netherlands Organization for Scientific Research, Petroleum Research Fund, *New Journal of Physics*, *Physical Chemistry Chemical Physics*, *Physical Review Letters*, *Physical Review E*, *Physics of Fluids*, *Physics Today*, *Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society A*, *Protein Engineering, Design, and Selection*, *Science*, *SIAM Journal of Applied Mathematics*, *Soft Matter*, U.S. Civilian Research and Development Foundation.

Administrative and Service Activities

- Advisory Committee for the Office of Digital Assets and Infrastructure, Yale University (2010-2011)
- Keynote speaker, Yale Pathways to Science, Outreach event for Yale's CRISP (October 2010)
- Panelist, Sterling Fellows Forum, Luce Hall, Yale University (April 2010).
- Invited Speaker, Society for Physics Students, Yale University (April 2010).
- Organizer of Prospective Graduate Student Open House for School of Engineering and Applied Science, Yale University (2009-2010).
- Member of Graduate Curriculum Committee for Department of Mechanical Engineering, Yale University (2008).
- Co-Founder and member of Executive Committee for Yale's Integrated Graduate Program in Physical and Engineering Biology (2008-present).
- Member of Executive Committee for Yale's Raymond and Beverly Sackler Institute for Biological, Physical, and Engineering Sciences (2008-present).
- Member of Yale College Writing Center Advisory Committee (2005-2008).
- Member of Graduate Admissions Committee for Yale's School of Engineering and Applied Science (2003-2010).
- Faculty representative to Admissions Committee for Yale College (2005).
- Member of Graduate Prize Committee for Faculty of Engineering, Yale University (2004).
- Colloquium organizer for Department of Mechanical Engineering, Yale University (2004).
- First-year academic advisor for Ezra Stiles College, Yale University (2004-2006).