

## Anthony Duprat Dinsmore

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### **Education**

UNIVERSITY OF PENNSYLVANIA, Philadelphia, PA.  
•Ph.D. in Physics, July, 1997. Advisor: Professor Arjun G. Yodh  
Thesis: Entropic Forces & Phase Transitions in Binary Nearly Hard-Sphere Colloids.  
YALE UNIVERSITY, New Haven, CT.  
•B.S. in Physics, June, 1992.

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### **Employment**

UNIVERSITY OF MASSACHUSETTS AMHERST, Department of Physics, 9/01-present.  
•Associate Professor of Physics (2007 - )  
•Assistant Professor of Physics (2001 - 2007)  
•Adjunct Professor of Polymer Science and Engineering (2002 - )  
HARVARD UNIVERSITY, Division of Engineering and Applied Sciences, 9/99-9/01.  
•Postdoctoral fellow. Advisor: Professor David A. Weitz.  
NAVAL RESEARCH LABORATORY, Center for Bio/Molecular Science and Engineering  
•National Research Council Postdoctoral Fellow, 9/97-9/99.  
Supervisor: B.R. Ratna, Ph.D.

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### **Awards**

OUTSTANDING TEACHING AWARD, UMASS COLLEGE OF NATURAL SCIENCES AND MATHEMATICS. Nominated, 2005-2006 (not an award recipient).  
COTTRELL SCHOLAR AWARD, Research Corporation, 2004.  
•Competitive scholarship and grant recognizing excellence in teaching and research.  
ALAN BERMAN RESEARCH PUBLICATIONS AWARD, Naval Research Laboratory, 1999.  
•For authorship of outstanding publication.  
ELIAS BURSTEIN AWARD, University of Pennsylvania, 1998.  
•For outstanding thesis in condensed-matter physics.  
MATERIALS RESEARCH SOCIETY GRADUATE STUDENT AWARD (FINALIST), 1997.  
NATIONAL RESEARCH COUNCIL POSTDOCTORAL FELLOWSHIP, 1997-1999.

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### **Major Service, National and Regional**

WORKSHOP ON "CURRENT CHALLENGES AND EMERGING AREAS IN SOFT MATTER: OPPORTUNITIES WITH NEUTRONS," participant in invitation-only panel held at the Oak Ridge National Lab. July, 2011.  
INVITED PARTICIPANT, NSF-SPONSORED WORKSHOP on "Science and Technology of Dispersants Relevant to Deep Sea Floor Oil Releases," Sept. 2010.  
EXECUTIVE BOARD OF THE NEW ENGLAND SECTION OF THE AMERICAN PHYSICAL SOCIETY (NES-APS). Elected Member, 2006-2009.  
CONFERENCE CO-ORGANIZER:  
• 86<sup>th</sup> ACS Colloids & Surface Science Symposium June 2012, special symposium on "Particles at Liquid Interfaces," with Kate Stebe.  
• American Physical Society meeting, March 2010, special focus session on "Polymer Colloids," with Ken Schweizer.  
• Joint meeting of the International Association of Colloid and Interface Scientists (IACIS) and the American Chemical Society (ACS), June 2009. Special session on "Clustering," with Paul Dubin.

- New England Complex Fluids Workshops (three), co-organized in June 2002, 2004, and 2011. Each was a one-day conference with 4 invited speakers, ~20 contributed “sound-bites” and ~70 attendees.

CO-ORGANIZER, UMASS SUMMER SCHOOL ON SOFT SOLIDS AND COMPLEX FLUIDS, three times: June of 2009, 2010, 2011. (4 days each, ~40 attendees.).

LECTURER (INVITED), UMASS SUMMER SCHOOL ON SOFT SOLIDS AND COMPLEX FLUIDS, JUNE 2008. (4 days, ~35 attendees.) Lecturer on “Physics of Colloids.”

CO-ORGANIZER, BOULDER SCHOOL IN CONDENSED MATTER AND MATERIALS PHYSICS, 2006. Co-organized the 2006 School on “Soft Matter: Complex Fluids and Biological Materials.” (with C. O’Hern, E. Dufresne and T. Powers). The commitment was substantial. Our responsibilities included choosing and inviting lecturers, setting the schedule, admitting students (approx 1 out of 3 applicants), attending the school, and stimulating participation. The school ran for 4 weeks in June-July, 2006; I attended for two weeks (as was typical for this year).

REVIEWER OF GRANT PROPOSALS AND MANUSCRIPTS. Routinely review manuscripts for *Phys. Rev. Lett.* and *Phys. Rev B & E, Science, Nature Materials, Macromolecules, Langmuir, J. Amer. Chem. Soc., J. Chem. Phys., Nanotechnology, JSTAT*, and others on a regular basis. Also review grant proposals submitted to the NSF, the Research Corporation, the Dept of Energy, NASA, and the ACS-PRF. Average rate of reviews is about 40 per year. Also regularly serve on review panels for NSF and NASA.

**Major Service,  
Local and  
Campus (last 5  
years)**

PHYSICS DEPARTMENT MACHINE-SHOP COMMITTEE, CHAIR. Provide oversight, Chaired a search committee for new machinist/tool maker (2010- ).

FACULTY STEERING COMMITTEE for Interdisciplinary Concentration in the Sciences (*iCons*), a new academic program in the College of Natural Sciences and Mathematics of the University of Massachusetts. (January 2009 – )

DIRECTOR OF THE HONORS PROGRAM, Department of Physics (2010-).

DIRECTOR OF THE UNDERGRADUATE PROGRAM, Department of Physics (2009).

CURRICULUM AND AWARD COMMITTEES OF THE COLLEGE OF NATURAL SCIENCE AND MATHEMATICS, UMass. Member, 2009.

GRADUATE ADMISSIONS COMMITTEE, Department of Physics, 2005 – 2007. Review graduate applications, select admitted students, and recruit them.

GRADUATE ADVISING COMMITTEE, Department of Physics, 2004/5 –2005/2006. Served as academic advisor to a portion of the incoming graduate class.

UNDERGRADUATE ADVISING COMMITTEE, Department of Physics, 2005 – 2009. I advised the class of 2009 starting from their first year at UMass through their graduation.

FACULTY SEARCH COMMITTEES. Served on several search committees of the Physics and other departments up through 2010. Chair of Biological Physics search in 2008.

SEMINAR COMMITTEES. Served as co-organizer of the Condensed Matter Seminar Series (with one other faculty member) in the F02, S04, S06, F10 semesters. Includes supervising the 860s course credit for graduate students. As part of the 2006 seminar series, I organized the ‘Mini-March-Meeting at UMass,’ a series of ~20 presentations of APS March-Meeting talks as part of our seminar series. This was a very successful effort to keep the condensed matter group abreast of research done locally.

DISSERTATION COMMITTEES, Departments of Physics, Chemistry, Chemical Engineering, and Polymer Science and Engineering. I typically serve on approximately 25-40 active committees (including 5 as director, currently).

**Outreach and  
Other Service  
(Last 5 years)**

STEM SCIENCE AND ENGINEERING SATURDAY SEMINAR, and UMASS PROGRAM FOR ENCOURAGING TOMORROW’S SCIENTISTS (UM-PETS), 2003, 2006, AND

2011. Presented 4-hour seminars to K-12 science teachers (part of a regular series organized by Morton Sternheim of UMass Physics). Topic: "Colloids, Emulsions, and Foams." Focus was on explaining the basic concepts of a colloid, surface tension, Brownian motion, and the states of matter. Emphasis was on providing materials that teachers could use in their classrooms.

FRESHMAN COLLOQUIUM, PHYSICS 381 AND GRADUATE SEMINAR, UMASS AMHERST. Presented one-hour research lectures to students in support of courses taught by my colleagues (Annually).

OTHER outreach through local schools, *ad-hoc*.

## Teaching

### UNDERGRADUATE LEVEL:

PHYSICS 152: Introductory Electricity and Magnetism and Thermodynamics (F09, S10, F10; 200-300 students)

PHYSICS 261/284: Intermediate Physics (Introductory Quantum mechanics, wave mechanics, and special relativity (S03-06; 35-80 students)

PHYSICS 289: Intermediate Physics Laboratory Class. (F11; approx. 40 students)

PHYSICS 286: Modern Physics Laboratory Class. (S07-09; approx. 60 students)

PHYSICS 440: Intermediate (junior/senior) Lab (F01-03, F07; 12 students)

PHYSICS 558: Solid State Physics (S11, approx. 12 students)

NAT SCI 191P: Residential Academic Program course – a 1-credit seminar on "Science Connections" designed to introduce 1<sup>st</sup>-year students to research. (F08, S09, F10, F11, 24 students)

### GRADUATE LEVEL:

PHYSICS 850: SOFT CONDENSED MATTER PHYSICS. A course of my own design (F04, F05, 11-30 students)

PHYSICS 890B: GLUCKSTERN LECTURES IN BIOLOGICAL PHYSICS. Co-taught with Adrian Parsegian. (F10, S11; 12-30 students)

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## Publications in Journals (Refereed)

46. J. B. Hutchison, R. M. Weis, A. D. Dinsmore, "Change of Line Tension in Phase-Separated Vesicles upon Protein Binding," submitted to *Biophys. J* (2011).
45. X. Peng and A. D. Dinsmore, "High Refractive-index Tin Sulfide Core-shell Spheres for Photonic Applications," submitted to *J. Mater. Res.* (2011).
44. J. A. Labastide, M. Baghgar, I. Dujovne, Y. Yang, A. D. Dinsmore, B. Sumpter, D. Venkataraman, M. D. Barnes, "Polymer Nanoparticle Superlattices for Organic Photovoltaic Applications," submitted to *J. Phys. Chem. Lett.* (2011).
43. A. D. Dinsmore, P. L. Dubin, G. M. Grason, "Clustering in Complex Fluids," *J. Phys. Chem. B* **115**, 7173 (2011). (Cover; Front matter for the Special Issue on "Clusters in Complex Fluids.")
42. J. R. Savage, L. Pei, A. D. Dinsmore, "Experimental Studies of Two-Step Nucleation during Two-Dimensional Crystallization of Colloidal Particles with Short-Range Attraction," to appear in *Advances in Chemical Physics* (2011).
41. E. Kizilay, S. Maccarrone, E. Foun, A. D. Dinsmore, P.L. Dubin, "Clustering in Polyelectrolyte-Micelle Complex Coacervation," *J. Chem. Phys. B* **115**, 7256 (2011).
40. K. Du, E. Glogowski, T. Emrick, T. P. Russell, and A. D. Dinsmore, "Adsorption Energy of Nano- and Microparticles at Liquid-liquid Interfaces," *Langmuir* **26**, 12518 (2010).
39. J. R. Savage and A. D. Dinsmore, "Experimental Evidence for Two-Step Nucleation in Colloidal Crystallization," *Phys. Rev. Lett.* **102**, 198302 (2009).
38. K. Du, C. R. Knutson, E. Glogowski, K. D. McCarthy, R. Shenhar, V. M. Rotello, M. T. Tuominen, T. Emrick, T. P. Russell, and A. D. Dinsmore, "Self-Assembled Electrical Contact to Nanoparticles Using Metallic Droplets," *Small* **5**, 1974 (2009). Reviewed in "News and Views"

- article in Nature Nanotechnology, by D. Vanmaekelbergh [Nature Nano 4, 475 (2009)]. Also listed in the "Research Highlights" section of Nature Nano in July.
37. J. Zhou and A. D. Dinsmore, "Statistical model of contacts and forces in random granular media," *JSTAT* **5**, L05001 (2009).
  36. M. L. Henle, R. McGorty, A. B. Schofield, A. D. Dinsmore and A. J. Levine, "The Effect of Curvature and Topology on Membrane Hydrodynamics," *Europhys. Lett.* **84**, 48001 (2008).
  35. X. T. Peng and A. D. Dinsmore, "Light Propagation in Strongly Scattering, Random Colloidal Films: The Role of the Packing Geometry," *Phys. Rev. Lett.* **99**, 143902 (2007).
  34. D. B. Lawrence, Tong Cai, Zhibing Hu, Manuel Marquez, A. D. Dinsmore, "Temperature-Responsive, Semi-Permeable Capsules Composed of Colloidal Microgel Spheres," *Langmuir* **23**, 395 (2007).
  33. C. R. Knutson, K. V. Edmond, M. T. Tuominen, A. D. Dinsmore, "Shuttling of Charge by a Metallic Sphere in Viscous Oil," *J. Appl. Phys.* **101**, 013706 (2007).
  32. J. R. Savage, D. W. Blair, A. J. Levine, R. A. Guyer, A. D. Dinsmore, "Imaging the Sublimation Dynamics of Colloidal Crystallites," *Science* **314**, 795 (2006).
  31. K. V. Edmond, A. B. Schofield, M. Marquez, J. P. Rothstein, A. D. Dinsmore, "Stable Jets of Viscoelastic Fluids and Self-Assembled Cylindrical Capsules by Hydrodynamic Focusing," *Langmuir* **22**, 9052 (2006).
  30. J. Zhou, S. Long, Q. Wang, A. D. Dinsmore, "Measurement of Forces inside a Three-Dimensional Pile of Frictionless Droplets," *Science* **312**, 1631 (2006).
  29. C. Zeng, H. Bissig, A. D. Dinsmore, "Particles on Droplets: from Fundamental Physics to Novel Materials," *Solid State Comm.* **139**, 547 (2006).
  28. A. D. Dinsmore, V. Prasad, I. Y. Wong, D. A. Weitz, "Microscopic Structure and Elasticity of Weakly Aggregated Colloidal Gels," *Phys. Rev. Lett.* **96**, 185502 (2006).
  27. M. F. Hsu, M. G. Nikolaidis, A. D. Dinsmore, A. R. Bausch, V. D. Gordon, X. Chen, J. W. Hutchinson, D. A. Weitz, "Self-Assembled Shells Composed of Colloidal Particles: Fabrication and Characterization," *Langmuir* **21**, 2963 (2005).
  26. Y. Lin, A. Boeker, H. Skaff, D. Cookson, A. D. Dinsmore, T. Emrick, T. P. Russell, "Nanoparticle Assembly at Fluid Interfaces: Structure and Dynamics," *Langmuir* **21**, 191 (2005). (9 citations)
  25. A. Boeker, Y. Lin, K. Chiapperini, R. Horowitz, M. Thompson, V. Carreon, T. Xu, C. Abetz, H. Skaff, A. D. Dinsmore, T. Emrick, and T. P. Russell, "Hierarchical Nanoparticle Assemblies formed by Decorating Breath Figures," *Nature Materials* **3**, 302 (2004).
  24. E. R. Dufresne, E. I. Corwin, N. A. Greenblatt, J. Ashmore, D. Y. Wang, A. D. Dinsmore, J. X. Cheng, X. S. Xie, J. W. Hutchinson, D. A. Weitz, "Flow and Fracture in Drying Nanoparticle Suspensions," *Phys. Rev. Lett.* **91**, 224501 (2003).
  23. M.G. Nikolaidis, A.R. Bausch, M.F. Hsu, A.D. Dinsmore, M.P. Brenner, C. Gay, and D.A. Weitz, "Reply to 'Communications Arising from Like-Charged Particles at Liquid Interfaces'," *Nature* **424**, 1014 (2003).
  22. Y. Lin, H. Skaff, A. Böker, A. D. Dinsmore, T. S. Emrick, T. P. Russell, "Ultrathin Crosslinked Nanoparticle Membranes," *J. Amer. Chem. Soc. Comm.* **125**, 12690 (2003).
  21. Y. Lin, H. Skaff, T. S. Emrick, A. D. Dinsmore, T. P. Russell, "Nanoparticle Assembly and Transport at Liquid-Liquid Interfaces," *Science* **299**, 226-229 (2003).
  20. A. R. Bausch, M. J. Bowick, A. Cacciuto, A. D. Dinsmore, M. F. Hsu, D. R. Nelson, M. G. Nikolaidis, A. Travasset, D. A. Weitz, "Grain Boundary Scars and Spherical Crystallography," *Science* **299**, 1716-1718, (2003).
  19. V. Prasad, V. Trappe, A.D. Dinsmore, P.N. Segre, L. Cipelletti, D.A. Weitz, "Universal Features of the Fluid to Solid Transition for Attractive Colloidal Particles," *Faraday Discussions* **123**, 1-12 (2003).
  18. A. D. Dinsmore, M. F. Hsu, M. G. Nikolaidis, Manuel Marquez, A. R. Bausch, D. A. Weitz, "Colloidosomes: Self-Assembled, Selectively-Permeable Capsules Composed of Colloidal Particles," *Science* **298**, 1006-1008 (2002).

17. M.G. Nikolaides, A.R. Bausch, M.F. Hsu, A.D. Dinsmore, M.P. Brenner, C. Gay, and D.A. Weitz, "Electric-Field-Induced Capillary Attractions between Like-Charged Particles at Liquid Interfaces," *Nature* **420**, 299-301 (2002).
16. A. D. Dinsmore and D. A. Weitz, "Direct Imaging of Three-Dimensional Structure and Topology of Colloidal Gels," *J. Phys.- Condens. Matt.* **14**, 7581-7597 (2002).
15. A. D. Dinsmore, E. R. Weeks, V. Prasad, A. C. Levitt, D. A. Weitz, "Three-Dimensional Confocal Microscopy of Colloids," *Applied Optics* **40**, 4152-4159 (2001).
14. A. G. Yodh, K.-H. Lin, J. C. Crocker, A. D. Dinsmore, R. Verma, P. D. Kaplan, "Entropically Driven Self-Assembly and Interaction in Suspension," *Phil. Trans. R. Soc. London* **359**, 921-937 (2001).
13. S. B. Qadri, E. F. Skelton, A. D. Dinsmore, J. Z. Hu, W. J. Kim, C. Nelson, B. R. Ratna, "The Effect of Particle Size on the Structural Transitions in Zinc Sulfide," *J. Appl. Phys.* **89**, 115-119 (2001).
12. A. D. Dinsmore, D. S. Hsu, S. B. Qadri, J. O. Cross, T. A. Kennedy, H. F. Gray, B. R. Ratna, "Structure and Luminescence of Annealed Nanoparticles of ZnS:Mn," *J. Appl. Phys.* **88**, 4985-4993 (2000).
11. M. L. Breen, A. D. Dinsmore, R. H. Pink, S. B. Qadri, B. R. Ratna, "Sonochemically Produced ZnS-Coated Polystyrene Core-Shell Particles for Use in Photonic Crystals," *Langmuir* **17**, 903-907 (2000).
10. A. D. Dinsmore, D. S. Hsu, H. F. Gray, Y. Tian, S. B. Qadri, B. R. Ratna, "Mn-Doped ZnS Nanoparticles as Efficient Low-Voltage Cathodoluminescent Phosphors," *Appl. Phys. Lett.* **75**, 802-804 (1999).
9. S. B. Qadri, E. F. Skelton, D. Hsu, A. D. Dinsmore, J. Yang, H. F. Gray, B. R. Ratna, "Size-Induced Transition Temperature Reduction in Nanoparticles of Zinc Sulfide," *Phys. Rev. B* **60**, 9191-9193 (1999).
8. A. D. Dinsmore, A. G. Yodh, "Entropic Confinement of Colloidal Spheres in Corners on Silicon Substrates," *Langmuir* **15**, 314-316 (1999).
7. J. C. Crocker, J. A. Matteo, A. D. Dinsmore, A. G. Yodh, "Entropic Attraction and Repulsion in Binary Colloids Probed with a Line Optical Tweezer," *Phys. Rev. Lett.* **82**, 4352-4355 (1999).
6. A. D. Dinsmore, J. C. Crocker, A. G. Yodh, "Self-Assembly of Colloidal Crystals," *Curr. Opinion Colloid Interface Sci.* **3**, 5-11 (1998).
5. A. D. Dinsmore, D. T. Wong, P. Nelson, A. G. Yodh, "Hard Spheres in Vesicles: Curvature-Induced Forces and Particle-Induced Curvature," *Phys. Rev. Lett.* **80**, 409-412 (1998).
4. A. D. Dinsmore, P. B. Warren, W. C. K. Poon, A. G. Yodh, "Fluid-Solid Transitions on Walls in Binary Hard-Sphere Mixtures," *Europhys. Lett.* **40**, 337-342 (1997).
3. A. D. Dinsmore, A. G. Yodh, D. J. Pine, "Entropic Control of Particle Motion Using Passive Surface Microstructures," *Nature* **383**, 239-242 (1996).
2. A. D. Dinsmore, A. G. Yodh, D. J. Pine, "Phase Diagrams of Nearly Hard-Sphere Binary Colloids," *Phys. Rev. E* **52**, 4045-4057 (1995).
1. P. D. Kaplan, A. D. Dinsmore, A. G. Yodh, D. J. Pine, "Diffuse Transmission Spectroscopy -- A Structural Probe of Opaque Materials," *Phys. Rev. E* **50**, 4827-4835 (1994).

**Perspective article (editorial material):**

- A. D. Dinsmore, P. L. Dubin, G. M. Grason, "Clustering in Complex Fluids," *J. Phys. Chem. B* **115**, 7173 (2011).
- A. D. Dinsmore, "Colloids: a Useful Boundary," *Nature Materials* **6**, 921 (2007).

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**Patents**

1. T.S. Emrick, T. P. Russell, A. D. Dinsmore, H. Skaff, and Y. Lin, "Liquid-liquid Interfacial Nanoparticle Assemblies," US Patent No. 7,470,840 Dec. 30, 2008).

2. A. D. Dinsmore, M. Nikolaidis, M. Hsu, A. R. Bausch, M. Marquez, D. A. Weitz, "International Patent Application No. PCT/US01/46181: "Methods and Compositions for Encapsulating Active Agents."
  3. Y. Tian, A. D. Dinsmore, S. B. Qadri, B. R. Ratna, "Method of Preparing Nanocrystalline Orthosilicate-Based Phosphors," (Provisional Patent filed August 31, 1998).
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### ***Reviews of Research by Journalists or others***

- "Nanoelectronics: From droplets to devices," by Prof. Daniel Vanmaekelbergh, *Nature Materials* **4**, 475 (2009).
  - "Colloidal Encounters: A Matter of Attraction," by Prof. Daan Frenkel, *Science* **314**, 768 (2006).
  - "Nano World: Edible Nanotech on the Horizon," by C. Q. Choi (*UPI* article), Feb., 2005
  - "Topology from the Bottom up," by R. D. Kamien, Perspective in *Science* magazine, March, 2003:
  - "Crystals on a Ball," *National Science Foundation Highlights* page, March, 2003:
  - *Scientific American* News of the Day (3/14/2003), and *Scientific American* magazine, May 2003, p. 33 (News Scan)
  - "Nanoparticles Encapsulate Water Droplets," by L. Kalaugher, NanotechWeb.org, Jan, 2003.
  - "UMass Team Develops Novel Self-assembly Processes for Nanotech Applications," Innovations Reports, Jan, 2003.
  - "Designer Coatings," by A. Dove, A. Marshall, P. Mitchell, *Nature Biotechnology* **20**, 1213 (2003).
  - "Designer Capsules," by Charlotte Schubert and Ushma Savla, *Nature Medicine* **8**, 1362 (2003).
  - "Nanoparticles encapsulate water droplets," by Liz Kalaugher, *NanotechWeb*, Jan., 2003.
  - "Gentle Force of Entropy Bridges Disciplines," by D. Kestenbaum, *Science* **279**, 1849 (1998).
  - "Entropy Keeps Small Particles on Edge," by D. Vergano, *Science News* **150**, 182, (1996).
  - "Order out of Disorder," by V. Houlder, *Financial Times (London)*, Sept. 19, p. 21 (1996).
  - "Use Entropy to Put Particles Where You Want," by C. Joslin, *Inside R&D* **25**(39), 2 (1996).
  - "Getting Order out of a Mixture," by I. Peterson, *Science News* **145**, 223 (1994).
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### ***Selected Invited Seminars and Invited Conference Presentations (from past 5 years only)***

- *Levich Institute Seminar, City College of CUNY*. "Liquid Interfaces and Solid particles: from simple geometry to novel materials" Aug., 2011.
- *Smith College Physics Seminar*. "How Crystals Nucleate: Lessons learned from experiments with colloids." Sept., 2010.
- *Workshop on Kinetics and thermodynamics of multistep nucleation and self-assembly in nanosize materials*. (European Space Agency workshop in Brussels, Belgium in March, 2010. Invited presentation: "Experimental evidence for two-step nucleation in colloidal crystallization."
- *Harvard University, "Squishy Physics" seminar*. "Particles at Liquid Interfaces: Binding Energies, Curvature Effects, and Applications." May, 2010.
- *American Physical Society March Meeting, invited presentation*: "Sublimation Dynamics of Colloidal Microgel Crystals," 3/19/2009.
- *Yale University Department of Mechanical Engineering, invited seminar*: "Nucleation and Sublimation of Crystals: Insights from Experiments with Colloids" 1/21/2009.
- *Harvard University, "Squishy Physics" seminar*. "Watching crystals nucleate and melt: colloids as a model to study phase transitions." Dec., 2008.
- *Williams College Physics Department, invited colloquium*: "How Crystals Form: Colloids as a Tool to Study Phase Transitions" 10/24/2008.
- *Xerox Research Center, Webster NY, invited seminar*: "Forces and Structure in Granular Media: toward an ordered view of disordered solids," 9/23/2008

- Cornell University Physics Department, invited seminar*: “Nucleation and Sublimation of Crystals: Insights from Experiments with Colloids” Sept., 2008.
- Amherst College Physics Department, invited colloquium*: “How Crystals Melt: Colloids as a Tool to Study Phase Transitions.” 2/21/2008.
- Haverford College Physics Department, special lecturer (department colloquium and class on solid state physics)*. “How Crystals Melt: Colloids as a Tool to Study Phase Transitions,” Oct. 2007.
- Cottrell Research Conference of the Research Corporation*. Contributed poster: “Photonic Glasses: Effect of the Topology of Random Media on Light Propagation,” July 2007.
- University of California Los Angeles, Department of Chemistry, invited seminar*: “Imaging Nucleation and Sublimation of Colloidal Crystals,” 6/4/2007.
- American Physical Society March Meeting, invited presentation*: “Imaging the Dynamics of Freezing and Sublimation of Colloidal Crystals,” 3/2007.
- Optical Society of America, Frontiers in Optics 2006/Laser Science XXII Conference*, Rochester, New York, October 9, 2006. Invited presentation: “Light Propagation in Colloidal Crystals and Glass: The Role of the Packing Geometry.”
- University of Massachusetts Amherst, Department of Physics. Invited colloquium*: “How Crystals Melt: Colloids as a Tool to Study Phase Transitions.” 9/27/2006.
- University of Massachusetts Amherst, Center for UMass Industry Research on Polymers (CUMIRP) meeting*, May 2006, May 2007 and May 2008. Invited presentations.

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**Research  
Grants, Active**

- GULF OF MEXICO RESEARCH INITIATIVE. “The Science and Technology of Dispersants as Relevant to Deep-Sea Hydrocarbon Releases.” co-PI (Sole UMass participant in large consortium of ~40 PIs). Dates: 10/1/2011 – 9/30/2014. Total: \$10.3M. Dinsmore total: \$222,000.
- NATIONAL SCIENCE FOUNDATION, DMR-0907195. “Imaging the Dynamics of Melting and Freezing with Colloids.” Single-PI. Dates: 11/1/09 – 2/28/13. Total: \$400,000.
- NATIONAL SCIENCE FOUNDATION, CBET-0967620. “Particles on Curved Liquid Interfaces: Geometry Mechanics and Self-Assembly.” Lead PI (with B. Davidovitch). Dates: 5/1/10 – 4/30/13. Total: \$300,000.
- XEROX INC., “Granular Physics of Electrically Charged Particles.” Single-PI. Dates: 1/1/2008-12/31/2009. Total: \$60,000.
- NATIONAL SCIENCE FOUNDATION, MATERIALS RESEARCH SCIENCE AND ENGINEERING CENTER (MRSEC) ON POLYMERS, DMR-0820506. co-PI, with T. S. Emrick (PI) and ~20 other co-PIs. Dates: \$30,000 for A.D.D. (This has been awarded annually since 4/03.)
- DEPARTMENT OF ENERGY, “Energy Frontier Research Center.” co-PI, with T. P. Russell and P. Lahti (as PIs) and ~20 other co-PIs. 9/1/2009 – 8/31/2014.

**Research  
Grants, Expired**

- AMERICAN CHEMICAL SOCIETY PETROLEUM RESEARCH FUND, “Phase transitions in mixtures of micelles and polyelectrolytes: electrostatic assembly of soft colloids” PI, with Paul Dubin of UMass Chemistry. Dates: 1/1/2008-8/31/2011. Total: \$100,000
- BIOMEDICAL INNOVATION INITIATIVE AWARD, UMASS COLLEGE OF NATURAL SCIENCES AND MATHEMATICS. “Measurement of Curvature-Induced Forces on Membrane Proteins.” PI, with Robert M. Weis of UMass Chemistry (co-PI). Dates: 6/15/06-8/31/08. Total: \$75,000 (no indirect costs); ~\$37,000 for A.D.D.
- NATIONAL SCIENCE FOUNDATION, DMR-0605839. “Force Maps, Aging and Elasticity in Random, Non-equilibrium Solids.” Single-PI. Dates: 8/1/06 – 7/31/09. Total: \$345,000.

- RESEARCH CORPORATION COTTRELL SCHOLARSHIP PROGRAM. “Photonic Glasses: Effects of the Topology of Random Media on Light Propagation.” Single-PI. Dates: 6/1/2004 -. Total: \$75,000 (no indirect costs).
- NATIONAL SCIENCE FOUNDATION, NANOSCALE INTERDISCIPLINARY RESEARCH TEAM, CTS-0609107. “NIRT: Controlling Interfacial Activity of Nanoparticles: Robust Routes to Nanoparticle-based Capsules, Membranes, and Electronic Materials.” Co-PI with Emrick (PI), Russell, Menon and Freeman (of U. Texas Austin). Dates: 9/1/06 – 8/31/2010. Total: \$1,199,999; ~\$240,000 for A.D.D.
- NATIONAL SCIENCE FOUNDATION, IGERT: “Research and Innovation in Nanoscale Device Development.” Co-PI, with J. Watkins and M. Tuominen (PIs) and ~20 other co-PIs. Funding for one student awarded, 9/1/2008 - 8/31/2010.
- NATIONAL AERONAUTIC AND SPACE ADMINISTRATION (NASA), 02-OBPR-03-C-0188-0122. “Gelation of Particles on Droplets.” PI, with A. J. Levine (subcontractor). Dates: 6/1/05 – 9/30/06. Total: \$260,590; ~\$140,000 for A.D.D.
- NATIONAL SCIENCE FOUNDATION, MAJOR RESEARCH INSTRUMENTATION (MRI), CTS-0421043. “Development of a Filament Stretching Rheometer and Shear Micro-Rheometer with Optical Access for Measurements of Complex Fluids.” co-PI, with H. Winter (PI), J. Rothstein, and S. Bhatia. Dates: 8/1/04 – 7/31/06. Total: \$406,999.
- NATIONAL SCIENCE FOUNDATION, DMR-0305395. “Mapping Forces and Elasticity in Random Solids.” Single-PI. Dates: 8/1/03 – 7/31/06. Total: \$300,000.
- NATIONAL SCIENCE FOUNDATION, INSTRUMENTATION FOR MATERIALS RESEARCH PROGRAM (IMR) DMR-0216719. “Acquisition of Instrumentation for Research and Student Training in Imaging Fast Dynamics in Macroscopic Disordered Media.” co-PI, with N. Menon (PI), D. Candela and N. Easwar (Smith College). Dates: 8/1/03 – 7/31/06. Total: \$111,736.
- RESEARCH CORPORATION RESEARCH INNOVATION AWARD. “Direct Measurements of Defects and Melting in Colloidal Crystals.” Single-PI. Dates: 5/1/2003 – 4/30/05. Total: \$35,000 (no indirect costs).
- KRAFT FOODS, INC. GIFT. “Self-Assembly of Smart Materials.” Single-PI. Dates: 5/1/2003 – 4/30/05. Total: \$43,000 (no indirect costs).
- PETROLEUM RESEARCH FUND OF THE AMERICAL CHEMICAL SOCIETY. “Three-Dimensional Imaging of Structure, Topology, and Viscoelasticity of Gels.” Single-PI. Dates: 9/1/2002 – 8/31/04. Total: \$35,000 (no indirect costs).
- FACULTY RESEARCH GRANT, UNIVERSITY OF MASSACHUSETTS. “Novel Nano-Scale Self Assembly” Single-PI. Dates: 5/1/2002 – 4/30-2003. Total: \$13,970.
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***Mentored  
Students,  
Current***

**Graduate:**

- Jaime Hutchison
- Liquan Pei
- Nesrin Senbil
- Derek Wood
- Yipeng Yang

**Undergraduate:**

- Austin Barnes
- Ryan Horton
- Isaac Vega

***Mentored  
Students,  
Graduated***

**Postdoctoral Fellows:**

- Simona Maccarrone (2009-2011).
- Hugo Bissig (8/2004-8/2005), funded by the Swiss NSF.

**Undergraduate:**

- Brandon Hoover (UMass class of 2011; now at NIH)
- Benjamin Bromberg (UMass, class of 2012)
- Matthew Gratale (B.S. in Physics, 2008), Univ. of Pennsylvania, Physics Ph.D. program.
- Timothy Prisk (B.S. in Physics, 2007), Univ. of Indiana Bloomington Physics Ph.D. program.
- Nathan Lindzen (B.S. in Chemistry 2007). *Co-advisor: R. M. Weis of UMass Chemistry Dept.*
- David Lawrence (B.S. in Physics 2006), New York University Law School.
- Ryan McGorty (B.S. in Physics 2005), Harvard University Physics Dept., Ph.D. program. (Ryan was also a winner of the nationally competitive Goldwater Scholarship based on his scholarship and research at UMass)
- Yutaka Maki (B.S. in Physics 2005), Teach for America.
- Kazem Edmond (B.S. in Physics 2004), Emory Physics, Ph.D. program.
- Randal Leiter (B.S. in Physics 2004), MIT Plasma Science & Fusion Center.
- Melissa Motew (B.S. in Physics 2002). Research staff, Lincoln Lab.

**Graduate:**

- Chuan Zeng (Ph.D. 2011) Now postdoc at Massachusetts General Hospital.
- Kan Du (Ph.D. 2010). *Co-advisor: T. P. Russell of UMass Polymer Sci. Eng. Dept.* Now Postdoctoral Fellow at NIST.
- Xiaotao Peng (Ph.D. in Physics, 9/2007). Now optical engineer with AFOP, Sunnyvale, CA
- Jing Zhou (Ph.D. in Physics, 8/2007). Now research Physicist with Xerox Innovation Group, Rochester NY.
- John Savage (Ph.D. in Physics, 8/2007). Went to Cornell (postdoc), now at Liquidia company.
- Rui Kong (M.S. in Physics 2006). Now at Univ. Houston, Master of Finance Program.
- Christopher Knutson (M.S. in Physics 2004). Now full-time research scientist, Arrayx, Inc. Chicago, IL.
- Versa (Elizabeth) Clark (M.S. in Physics 2004). Now full-time teacher, Holyoke, MA.
- Christian Guertin (M.S. in Physics 2003). Now full-time research scientist, Vermont Photonics, Bellows Falls, VT.