

Curriculum Vitæ: FRANCIS W. STARR

1 Address

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2 Employment

1. Associate Professor, Physics Department, Wesleyan University, Middletown, CT, July 2009 - present.
2. Assistant Professor, Physics Department, Wesleyan University, Middletown, CT, July 2003 - June 2009.
3. Deputy Director, Center for Theoretical and Computational Materials Science; Physicist, Polymers Division, N.I.S.T., Gaithersburg, MD, May 2001 - August 2003.
4. N.R.C. Postdoctoral Associateship, N.I.S.T., Gaithersburg, MD, August 1999 - August 2001; Advisor: Sharon C. Glotzer
5. Research Assistant, Physics Division, Oak Ridge National Lab. Jan. 1994 - June 1994.

3 Visiting Appointments

1. Visiting Professor, Universitat de Barcelona, Departament de Fisica Fonamental, Master on Computational and Applied Physics program, Barcelona, Spain. May 2009.
2. Lecturer, College on Computational Physics, International Centre for Theoretical Physics, Trieste, Italy. May-June 1997.

4 Education

1. Ph.D., Physics, 1999; Advisor: H. Eugene Stanley, Boston University, Boston, MA
2. M.A., Physics, 1999; Boston University, Boston, MA
3. B.S. with University Honors, Physics, 1994; Carnegie Mellon University, Pittsburgh, PA

5 Publications

Current ISI Web of Science *h*-index: 28
Wesleyan student authors are starred (*).

5.1 Peer-Reviewed Research Articles

1. C. W. Hsu*, F. Sciortino, and **F. W. Starr**
Theoretical Description of a DNA-Linked Nanoparticle Self-Assembly
Accepted for publication in *Physical Review Letters* (2010).
2. J. Jancar, J.F. Douglas, **F. W. Starr**, S.K. Kumar, P. Cassagnau, A.J. Lesser, S.S. Sternstein, M.J. Buehler
Current issues in research on structure-property relationships in polymer nanocomposites
Feature Article in *Polymer*, **51**, 3321-3343 (2010).
Article featured on the cover of the July 12, 2010 issue.
3. S. T. Knauert*, J. F. Douglas, and **F. W. Starr**
Morphology and Transport Properties of Two-Dimensional Sheet Polymers
Macromolecules **43**, 3438-3445 (2010).
Article featured on the cover of the April 13, 2010 issue.
4. J. L. Rivera and **F. W. Starr**
Rapid Transport of Water via a Carbon Nanotube Syringe
Journal of Physical Chemistry C, **114**, 3737-3742 (2010).

5. W. Dai*, C. W. Hsu*, F. Sciortino, and **F. W. Starr**
Valency Dependence of Polymorphism and Polyamorphism in DNA-Functionalized Nanoparticles
Langmuir **26**, 3601-3608 (2010).
6. L. Xu, F. Mallamace, Z. Yan, **F. W. Starr**, S. V. Buldyrev, and H. E. Stanley
Appearance of a Fractional Stokes-Einstein Relation in Water and a Structural Interpretation of Its Onset
Nature Physics, **5**, 565-569 (2009).
7. C. W. Hsu* and **F. W. Starr**
Interpenetration as a Mechanism for Liquid-Liquid Phase Transitions
Physical Review E **79**, 041502 (2009).
8. C. W. Hsu*, J. Largo, F. Sciortino, **F. W. Starr**
Hierarchies of networked phases induced by multiple liquid-liquid critical points
Proceedings of the National Academy of Sciences of the USA **105**, 13711-13715 (2008).
9. A. J. Rahedi*, J. F. Douglas, and **F. W. Starr**
Model for Reversible Nanoparticle Assembly in a Polymer Matrix
Journal of Chemical Physics, **128**, 024902 (2008); also selected to appear in the *Virtual Journal of Nanoscale Science & Technology* and the *Virtual Journal of Biological Physics Research*.
10. J. L. Rivera, J. L. Rico, and **F. W. Starr**
Interaction of Water with Cap-Ended Defective and Non-Defective Small Carbon Nanotubes
Journal of Physical Chemistry C, **111**, 18899-18905 (2007).
11. M. G. Mazza, N. Giovambattista, H. E. Stanley, and **F. W. Starr**
Connection of translational and rotational dynamical heterogeneities with the breakdown of the Stokes-Einstein and Stokes-Einstein-Debye relations in water
Physical Review E **76**, 031203 (2007); also selected to appear in the *Virtual Journal of Biological Physics Research*, **14** (2007).
12. S. T. Knauert*, J. F. Douglas, and **F. W. Starr**
The Effect of Nanoparticle Shape on Polymer-Nanocomposite Rheology and Tensile Strength
Journal of Polymer Science Part B: Polymer Physics **45**, 1882-1897 (2007).
Chosen by editors as a Highlight Article.
13. P. Kumar, S. V. Buldyrev, S. R. Becker*, P. H. Poole, **F. W. Starr**, and H.E. Stanley
Breakdown of the Stokes-Einstein Relation in Supercooled Water
Proceedings of the National Academy of Sciences of the USA **104**, 9575-9579 (2007).
14. J. Largo, **F. W. Starr**, and F. Sciortino
Self-assembling DNA dendrimers: A numerical study
Langmuir **23**, 5896-5905 (2007).
15. P. Kumar, **F. W. Starr**, S. V. Buldyrev, and H. E. Stanley
Effect of water-wall interaction potential on the properties of nanoconfined water
Physical Review E **75**, 011202 (2007); also selected to appear in the *Virtual Journal of Nanoscale Science & Technology* (2007).
16. J. L. Rivera, **F. W. Starr**, P. Paricaud, and P. T. Cummings
Polarizable contributions to the surface tension of liquid water
Journal of Chemical Physics **125**, 094712 (2006).
17. S. R. Becker*, P. H. Poole, and **F. W. Starr**
Fractional Stokes-Einstein and Debye-Stokes-Einstein relations in a network forming liquid
Physical Review Letters **97**, 055901 (2006).
18. **F. W. Starr** and F. Sciortino
Model for Assembly and Gelation of Four-Armed DNA Dendrimers
Letter, *Journal of Physics: Condensed Matter* **18**, L347-L353 (2006).
Selected by editors for the IoP Select special collection of journal articles (<http://Select.iop.org>).
19. M. Mazza, N. Giovambattista, **F. W. Starr**, and H. E. Stanley
Relation between Rotational and Translational Dynamic Heterogeneities in Water
Physical Review Letters **96**, 057803 (2006).
20. P. Kumar, S.V. Buldyrev, **F. W. Starr**, N. Giovambattista, and H.E. Stanley
Thermodynamics, Structure, and Dynamics of Water Confined between Hydrophobic Plates
Physical Review E **72**, 051503 (2005).

21. J. C. Conrad, **F. W. Starr**, D. A. Weitz
Weak Correlations between Local Density and Dynamics near the Glass Transition
Journal of Physical Chemistry B **109**, 21235-21240 (2005).
22. N. Giovambattista, S. V. Buldyrev, H. E. Stanley, and **F. W. Starr**
Clusters of mobile molecules in supercooled water
Physical Review E **72**, 011202 (2005).
23. Y. Gebremichael, M. Vogel, M. Bergroth, **F. W. Starr**, and S. C. Glotzer
Spatially Heterogeneous Dynamics and the Adam-Gibbs Relation in the Dzugutov Liquid
Journal of Physical Chemistry B **109**, 15068-15079 (2005).
24. N. Giovambattista, M. G. Mazza, S. V. Buldyrev, **F. W. Starr**, and H. E. Stanley
Dynamic heterogeneities in supercooled water
Journal of Physical Chemistry B, **108**, 6655-6662 (2004).
25. **F. W. Starr**, J. F. Douglas, and S. C. Glotzer
Origin of Particle Clustering in a Simulated Polymer Nanocomposite and its Impact on Rheology
Journal of Chemical Physics **119**, 1777-1788 (2003); also selected to appear in the *Virtual Journal of Nanoscale Science & Technology* **8** (2003).
26. N. Giovambattista, S. V. Buldyrev, **F. W. Starr**, and H. E. Stanley
Connection between Adam-Gibbs Theory and Spatially Heterogeneous Dynamics
Physical Review Letters **90**, 085506 (2003).
27. **F. W. Starr**, C. A. Angell, and H. E. Stanley
Prediction of entropy and dynamic properties of water below the homogeneous nucleation temperature
Physica A **323**, 51-66 (2003).
28. M. Aichele, Y. Gebremichael, **F. W. Starr**, J. Baschnagel, and S. C. Glotzer
Stringlike correlated motion in the dynamics of supercooled polymer melts
Journal of Chemical Physics **119**, 5290-5304 (2003).
29. N. Lačević, T. B. Schröder, **F. W. Starr**, and S. C. Glotzer
Spatially heterogeneous dynamics investigated via a time-dependent four-point density correlation function
Journal of Chemical Physics **119**, 7372-7387 (2003).
30. **F. W. Starr**, C. A. Angell, E. La Nave, S. Sastry, A. Scala, F. Sciortino, and H. E. Stanley
Dynamics of deeply supercooled water
Biophysical Chemistry **105**, 573-583 (2003).
31. **F. W. Starr**, S. Sastry, J. F. Douglas, and S. C. Glotzer
What do we learn from the local geometry of glass-forming liquids?
Physical Review Letters **89**, 125501 (2002).
32. N. Giovambattista, **F. W. Starr**, F. Sciortino, S. V. Buldyrev and H. E. Stanley
Transitions between Inherent Structures in Water
Physical Review E **65**, 041502 (2002).
33. P. A. Netz, **F. Starr**, M. C. Barbosa, and H. E. Stanley
Translational and rotational diffusion in stretched water
Journal of Molecular Liquids **101**, 159-168 (2002).
34. **F. W. Starr**, T. B. Schröder, and S. C. Glotzer
Molecular dynamics simulation of a polymer melt with a nanoscopic particle
Macromolecules **35**, 4481-4492 (2002).
35. N. Lačević, **F. W. Starr**, T. B. Schröder, V. N. Novikov, and S. C. Glotzer
Growing correlation length on cooling below the onset of caging in a simulated glass-forming liquid
Rapid Communication, *Physical Review E* **66**, 030101 (2002).
36. **F. W. Starr**, S. Sastry, E. La Nave, A. Scala, H. E. Stanley, and F. Sciortino
Thermodynamic and structural aspects of the potential energy surface of simulated water
Physical Review E, **63**, 041201 (2001).
37. P. A. Netz, **F. W. Starr**, H. E. Stanley, and M. C. Barbosa
Static and dynamic properties of stretched water
Journal of Chemical Physics **115**, 344-348 (2001).

38. **F. W. Starr**, T. B. Schröder, and S. C. Glotzer
Effects of a nanoscopic filler on the structure and dynamics of a simulated polymer melt and the relationship to ultra-thin films
Physical Review E, **64**, 021802 (2001).
39. Y. Gebremichael, T. B. Schröder, **F. W. Starr**, and S. C. Glotzer
Spatially correlated dynamics in a simulated glass-forming polymer melt: Analysis of clustering phenomena
Physical Review E **65**, 051503 (2001).
40. E. La Nave, A. Scala, **F. W. Starr**, F. Sciortino, and H. E. Stanley
Dynamics of Supercooled Water in Configuration Space
Physical Review E **64**, 036102 (2001).
41. A. Scala, **F. W. Starr**, E. La Nave, F. Sciortino, and H. E. Stanley
Configurational Entropy and Diffusivity of Supercooled Water
Nature **406**, 166-169 (2000).
42. E. La Nave, A. Scala, **F. W. Starr**, F. Sciortino, and H. E. Stanley
Instantaneous Normal Mode Analysis of Supercooled Water
Physical Review Letters **84**, 4605-4608 (2000).
43. **F. W. Starr**, J. K. Nielsen, and H. E. Stanley
Hydrogen Bond Dynamics in the extended simple point charge model of water
Physical Review E **62**, 579-587 (2000).
44. A. Scala, **F. W. Starr**, E. La Nave, H. E. Stanley, and F. Sciortino
Free Energy Surface of Supercooled Water
Physical Review E **62**, 8016-8020 (2000).
45. **F. W. Starr**, J. K. Nielsen, and H. E. Stanley
Fast and Slow Dynamics of Hydrogen Bonds in Liquid Water
Physical Review Letters **82**, 2294-2297 (1999).
46. **F. W. Starr**, S. Harrington, F. Sciortino, and H. E. Stanley
Slow Dynamics of Water under Pressure
Physical Review Letters **82**, 3629-3632 (1999).
47. **F. W. Starr**, M.-C. Bellissent-Funel, and H. E. Stanley
Structure of supercooled and glassy water
Physical Review E **60**, 1084-1087 (1999).
48. **F. W. Starr**, F. Sciortino, and H. E. Stanley
Dynamics of simulated water under pressure
Physical Review E, **60**, 6757-6768 (1999).
49. M. Canpolat, **F. W. Starr**, M. R. S.-Lahijany, A. Scala, O. Mishima, S. Havlin, and H. E. Stanley
Local Structural Heterogeneities in Liquid Water under Pressure
Chemical Physics Letters **294**, 9-12 (1998).
50. **F. W. Starr**, S. T. Harrington, B. M. Boghosian, and H. E. Stanley
Interface Roughening in a Hydrodynamic Lattice-Gas Model with Surfactant
Physical Review Letters **77**, 3363-3366 (1996).

5.2 Book Chapters

51. **F.W. Starr** and S.C. Glotzer, "Science and Engineering of Nanoparticle-Polymer Composites: Insights from Computer Simulation", in "Soft Materials: Structure and Dynamics," p107-124. Edited by J.R. Dutcher and A.G. Marangoni (Marcel Dekker, N.Y., 2004).

5.3 Educational Articles

52. **F.W. Starr**, "Cyberinfrastructure and the Sciences at Liberal Arts Colleges." *Academic Commons: Special Cyberinfrastructure Issue*, December 2007.
<http://www.academiccommons.org/commons/essay/francis-starr>.

5.4 Peer-Reviewed Conference Proceedings

53. H. E. Stanley, S. V. Buldyrev, G. Franzese, N. Giovambattista, and **F.W. Starr**, “Static and Dynamic Heterogeneities in Liquid Water,” [Proc. Royal Society Discussion Meeting on the topic of “Configurational landscapes and structural transitions in clusters, fluids and biomolecules”]. *Phil. Trans. Royal Soc. A: Mathematical, Physical, and Engineering Sciences* **363**, 509–523 (2005).
54. H.E. Stanley, S.V. Buldyrev, N. Giovambattista, E. La Nave, S. Mossa, A. Scala, F. Sciortino, **F.W. Starr**, and M. Yamada, “Application of Statistical Physics to Understand the Static and Dynamic Anomalies in Liquid Water”. *Journal of Statistical Physics* **110**, 1039-1054 (2003).
55. S.C. Glotzer, Y. Gebremichael, N. Lačević, T.B. Schröder, and **F.W. Starr**, “Glass-Forming Liquids and Polymers: With a Little Help From Computational Statistical Physics”, *Computer Physics Communications* **146**, 24-29 (2002).
56. H. E. Stanley, S. V. Buldyrev, M. Canpolat, O. Mishima, M. R. Sadr-Lahijany, A. Scala, and **F.W. Starr**, “The Puzzling Behavior of Water at Very Low Temperature” [Proc. International Meeting on Metastable Fluids, Bunsengesellschaft] *Physical Chemistry and Chemical Physics (PCCP)*, **2**, 1551-1558 (2000).

5.5 Other Conference Proceedings

57. P.A. Netz, **F.W. Starr**, M.C. Barbosa, and H.E. Stanley, “Computer Simulation of Dynamical Anomalies in Stretched Water.” *Brazilian Journal of Physics* **34**, 24-31 (2004).
58. N. Giovambattista, S. V. Buldyrev, **F.W. Starr**, and H. E. Stanley, “Dynamic Heterogeneities in Liquid Water,” in *Slow Dynamics in Complex Systems: 3rd International Symposium*, edited by M. Tokuyama and I. Oppenheim (AIP Conference Proceedings, Melville NY, 2004), pp. 483–490.
59. H.E. Stanley, S.V. Buldyrev, N. Giovambattista, E. La Nave, A. Scala, F. Sciortino, and **F.W. Starr**. “Statistical physics and liquid water: ‘What matters’ ”. [Proc. IUPAP Statphys21, Cancun] *Physica A* **306**, 230–242 (2002).
60. R.L. Jones, C.L. Soles, **F.W. Starr**, E.K. Lin, J.L. Lenhart, W.-L. Wu, D.L. Goldfarb, M. and Angelopoulos. “Chain conformations in ultrathin polymer resists”. *Proceedings of SPIE* **4690**, 342-350 (2002).
61. H. E. Stanley, M. C. Barbosa, S. Mossa, P. A. Netz, F. Sciortino, **F.W. Starr**, and M. Yamada, “Water at Positive and Negative Pressures” In *Proc NATO Advanced Research Workshop “Liquids Under Negative Pressure”, February 23-25, 2002*, A. Imre, Ed (Kluwer, Dordrecht, 2002).
62. P.A. Netz, **F.W. Starr**, M.C. Barbosa, and H.E. Stanley, “Relation between structural and dynamical anomalies in supercooled water”. *Physica A* **314**, 470-476 (2002).
63. H.E. Stanley, M.C. Barbosa, S. Mossa, P.A. Netz, F. Sciortino, **F.W. Starr**, and M. Yamada, “Statistical physics and liquid water at negative pressures”. *Physica A* **315**, 281-289 (2002).
64. S.C. Glotzer, Y. Gebremichael, N. Lačević, T.B. Schröder, and **F.W. Starr**, “Spatially heterogeneous dynamics in liquids near their glass transition”. *ACS Symposium Series* **820**, 214-227 (2002)
65. F. Sciortino, E. La Nave E, A. Scala A, H.E. Stanley, and **F.W. Starr**, “Water and its energy landscape”. *European Physics Journal E* **9**, 233-237 (2002).
66. S.C. Glotzer and **F.W. Starr**. “Multiscale Modeling of Filled and Nanofilled Polymers”. Proc. of Foundations of Molecular Modeling and Simulation (FOMMS 2000), AICHE Symposium Series **97** (2001).
67. **F.W. Starr** and S.C. Glotzer. “Simulation of filled polymer melts on multiple length scales”. *Proc. of Materials Research Society* **661** (2001).
68. H.E. Stanley, S.V. Buldyrev, O. Mishima, M.R. Sadr-Lahijany, A. Scala, and **F.W. Starr**, “Unsolved Mysteries of Water in its Liquid and Glassy Phases,” [Proc. Intl. Conf. on Liquid Matter] *J. Phys. Cond. Mat.* **12** A403-A412 (2000).
69. M. Canpolat, O. Mishima, M.R. Sadr-Lahijany, A. Scala, H.E. Stanley, and **F.W. Starr**, “The Hypothesized Low-Temperature, High-Pressure Second Critical Point in Liquid Water,” in *Steam, Water, and Hydrothermal Systems: Physics and Chemistry Meeting the Needs of Industry* [Proc. 13th Intl. Conf. on the Properties of Water and Steam, Toronto], edited by P. R. Tremaine, P. G. Hill, D. E. Irish, and P. V. Balakrishnan (NRC Research Press, Ottawa, 2000), pp. 494–500.

70. **F.W. Starr**, S. Sastry, F. Sciortino, and H.E. Stanley. “Supercooled Water: Dynamics, Structure and Thermodynamics”. Proceedings of the DAE (India) Solid State Physics Symposium 1999, Ed.s R. Mukhopadhyay, B. K. Godwal and S. M. Yusuf (Universities Press, India, 2000) *Solid State Physics (India)* **42**, 77 (1999).
71. S.V. Buldyrev, M. Canpolat, S. Havlin, O. Mishima, M.R. Sadr-Lahijany, A. Scala, **F.W. Starr**, and H.E. Stanley, “Physics of Supercooled Water: Possibility of Two Liquid Phases,” in *Slow Dynamics in Complex Systems: Proceedings of the 8th Tohwa University International Symposium*, edited by Michio Tokuyama and Irwin Oppenheim (AIP Conference Series, 1999), 243–256.
72. H. E. Stanley, S.V. Buldyrev, M. Canpolat, S. Havlin, O. Mishima, M. R. Sadr-Lahijany, A. Scala, and **F.W. Starr**. “The puzzle of liquid water: a very complex fluid”. [Proc. 18th Annual CNLS Conference on Quantifying Uncertainty in Models of Complex Phenomena] *Physica D* **133**, 453-462 (1999).
73. H.E. Stanley, S.T. Harrington, O. Mishima, P.H. Poole, S. Sastry, F. Sciortino, and **F.W. Starr**. “The Puzzling Statistical Physics of Liquid Water” [Proc. VIII Spanish Statistical Physics FISES '97], *Anales de Física, Monografías RSEF*, **4**, 21–30 (1998).
74. H. E. Stanley, S.V. Buldyrev, M. Canpolat, M. Meyer, O. Mishima, M. R. Sadr-Lahijany, A. Scala, and **F.W. Starr**. “The Puzzling Behavior of Liquid Water”. [Proc. Latin American Workshop on Condensed Matter Physics], *Physica A* **257**, 213-222 (1998).
75. H.E. Stanley, L. Cruz-Cruz, S.T. Harrington, P.H. Poole, S. Sastry, F. Sciortino, **F.W. Starr**, and R. Zhang. “Cooperative Molecular Motions in Water: The Liquid-Liquid Critical Point Hypothesis” [Proc. International Conf. on “Complex Fluids”]. *Physica A*, **236**, 19-37 (1997).
76. H.E. Stanley, S.T. Harrington, P.H. Poole, S. Sastry, F. Sciortino, and **F.W. Starr**. “Cooperative Molecular Motions in Water” [Proc. 1996 Kyoto YKIS Conf], *Prog. Theor. Phys. Suppl.* **126**, 201-206 (1997).
77. E. Neis, **F. W. Starr**, T. Handler. “Using Neural Networks as an Event Trigger in Elementary Particle Physics Experiments.” 1994 IEEE International Conference on Neural Networks **1-7**, 3056-3060 (1994).

6 Conference and Workshop Organization

1. Session Co-Organizer for *2010 APS March Meeting*, March 2010 in Portland, OR, USA. Session: Biological-Synthetic Hybrid Materials, co-sponsored by DPLOY and DBP.
2. Session Co-Organizer for *15th Symposium on Thermophysical Properties*, June 2003 in Boulder, CO, USA. Session: Properties of Polymers and Mesoscopic Systems.
3. Co-Organizer for *Workshop on Polymer-Nanoparticle Composite Materials*, May 2002 in Gaithersburg, MD, USA.
4. Co-Organizer for *Workshop on Predicting the Thermophysical Properties of Fluids by Molecular Simulation*, June 2001 in Gaithersburg, USA.

7 Presentations

7.1 Invited Talks

1. University of Massachusetts, Polymer Science and Engineering Department Colloquium, December 2009. Title: DNA Directed Nanoparticle Assemblies: What are the Rules?
2. University of Akron, College of Polymer Science and Engineering, July 2009. Title: DNA Directed Nanoparticle Assemblies: What are the Rules?
3. *Late Night with Nanocomposites II*, May 2009 in Brno, Czech Republic. Title: Origin and Effects of Nanoparticle Clustering in Polymer Nanocomposites.
4. Universitat de Barcelona, Departament de Física Fonamental Seminar, May 2009 in Barcelona, Spain. Title: DNA Directed Nanoparticle Assemblies.
5. *American Physical Society*, March 2009 in Pittsburgh, USA. Title: DNA Directed Nanoparticle Assemblies.
6. *BECAT-IBM Workshop on High Performance Computational Science and Engineering*, December 2008 in Storrs, CT. Title: Computational Methods applied to the Soft Materials.
7. *Ninth Annual Wesleyan Biophysics Retreat*, September 2008 in Middletown, CT. Title: DNA Functionalized Nanoparticles: Creating a Customized Chemistry Toolkit.

8. *NERCOMP: Cyberinfrastructure and The Liberal Arts: Institutions and the Future of Discipline-Based Research*, March 2008 in Amherst, MA. Title: Deploying Cyberinfrastructure for the Sciences at Liberal Arts Institutions.
9. Università di Roma La Sapienza, Dipartimento di Fisica, Gruppo Liquidi Seminar, January 2008 in Rome, Italy. Title: Polymer Nanocomposites: Nanoparticle Clustering, Phase Behavior, and Mechanical Properties.
10. *Materials Research Society*, November 2007 in Boston, MA. Title: Self-Assembled DNA Networks and Gels.
11. *Ninth Annual Greater Boston Area Statistical Mechanics Meeting*, October, 2007 in Boston, MA. Title: Using DNA as a template to design novel materials.
12. Wesleyan University, Chemistry Department Colloquium, October 2007 in Middletown, CT. Title: Two waters, no ice: polyamorphism in water and other fluids.
13. Boston University, Center for Computational Science Seminar, February 2007 in Boston, MA. Title: Molecular Dynamics Simulations: What can they do for you?
14. Clark University, Department of Physics Colloquium, November 2006 in Worcester, MA. Title: Some Assembly Required: Computer-Aided Design of Materials from the Bottom Up
15. *International Conference on Properties of Fluids and Phase Equilibria for Chemical Process Design*, Plenary Lecture, October 2006 in Morelia, Mexico. Title: Computer Simulations of Material Assembly and Design.
16. Università di Palermo, Department of Chemistry Colloquium; October 2006 in Palermo, Italy. Title: Some Assembly Required: Computational Approaches to Designing Materials from the Bottom Up.
17. *Patchy Colloids, Proteins and Network Forming Liquids: Analogies and new insights from computer simulations*, June 2006 at CECAM in Lyon, France. Title: Self-assembled structures of single-stranded DNA.
18. University of Massachusetts, Dartmouth, Department of Physics Colloquium; April 2006, Amherst, USA. Title: Some Assembly Required: designing new materials from the bottom up.
19. *American Physical Society*, March 2006 in Baltimore, USA. Title: Assembly and Gelation of Custom-Sequenced, Multifunctional DNA Dendrimers.
20. University of Massachusetts, Amherst, Department of Physics Seminar; September 2005, Amherst, USA. Title: Connecting Bulk Dynamics to Local Heterogeneity in Supercooled Water.
21. *229th ACS National Meeting*; March 2005, San Diego, USA. Title: Dynamics and phase behavior in supercooled and glassy water.
22. Yeshiva University, Department of Physics Colloquium; December 2004, New York, USA. Title: Digital Liquids: Computer Simulations of Soft Materials.
23. *International Union of Crystallography at High Pressure*, August 2004, Saskatoon, Canada. Title: Two Waters, No Ice: An Overview of Polyamorphism in H₂O.
24. *Unifying Concepts in Glass Physics*, June 2004, Bangalore, India. Title: Water as a Model Glass Former.
25. *78th ACS Colloid and Surface Science Symposium*, June 2004, New Haven, USA. Title: Thermoreversible Gelation and Polymer Nanocomposites.
26. University of California, Berkeley; Department of Bioengineering, November 2003, Berkeley, USA. Title: Dynamics of Supercooled Water.
27. *Scientific Opportunities for Cold Neutron Spectroscopy*, July 2003, Washington, USA. Title: Connections between Neutron Scattering and Molecular Simulation.
28. *Polymer Theory versus Polymer Experiment*, July 2003, Telluride, USA. Title: Interfacial Properties, Clustering Mechanism, and Rheology of Polymer Nanocomposites.
29. *15th Symposium on Thermophysical Properties*, June 2003, Boulder, USA. Title: What Controls the Structure and Properties of Polymer Nanocomposites?
30. Naval Research Laboratory, February 2003 in Washington, DC, USA. Title: Origin of Particle Clustering in a Simulated Polymer Nanocomposite.
31. *Workshop on Polymer-Nanoparticle Composite Materials*, May 2002 in Gaithersburg, USA. Title: Probing nanocomposite structure and properties using computer simulations.
32. Air Force Research Lab, Dayton, USA, March 2002.

33. *Unifying Concepts in Glass Physics*, February 2002 in Roma, Italy. Title: What can we learn from the local geometry of melts and liquids?
34. *The International Association for the Properties of Water and Steam Annual Meeting*, September 2001 in Gaithersburg, USA. (Canceled due to September 11, 2001 events.)
35. *New kinds of phase transitions: Transformations in disordered substances* (NATO-ARW) May 2001 on the Volga River, Russia.
36. U. Maryland Institute for Physical Science and Technology (IPST), December 2000. Title: Dynamics of Supercooled Liquids: Water as a Model Liquid.
37. Center for Neutron Research, NIST, Gaithersburg, MD. March 2000. Title: Thermodynamics and Dynamics of Supercooled Water.
38. *The Instantaneous Normal Mode Approach to Dynamics in Liquids*, July 1999 at CECAM in Lyon, France. Title: Dynamics and Configurational Entropy of Liquid Water.

7.2 Contributed Talks

1. *American Physical Society*, March 2010 in Portland, USA. Session Chair: Focus Session: Biological-Synthetic Hybrid Materials. Talks: 5 contributed talks with students.
2. *7th Liquid Matter Conference*, June 2008, Lund, Sweden. Title: Multiple Liquid-Liquid Critical Points for DNA-functionalized Nanoparticles
3. *Soft, Complex, and Biological Matter Conference*, July 2007 near Palermo, Italy. Title: DNA-based Nanomaterials: Controlling Phase Behavior, Structure, and Dynamics using Molecular Recognition.
4. *IV Workshop on Non Equilibrium Phenomena in Supercooled Fluids, Glasses and Amorphous Materials*, September 2006 in Pisa, Italy. Talk: Breakdown of the (Debye)-Stokes-Einstein Relation and Heterogeneous Dynamics.
5. *3rd New York / New England Granular Materials Workshop*, June 2005 at Wesleyan University in Middletown, CT. Talk: Can the Physics of Glasses contribute to the understanding of Granular Materials?
6. *American Institute of Chemical Engineers*, November 2003 in San Francisco, USA. Talks: (1) How Do We Relate Local Structure to Dynamics in Glass Forming Liquids? and (2) Origins of Particle Clustering and Effect On Properties.
7. *American Physical Society*, March 2003 in Austin, USA. Session Chair: Dynamics and the Glass Transition Talk: Computer Simulation of Fundamental Polymer Nanocomposite Properties.
8. *Nanomaterials and the Chemical Industry R&D Roadmap Workshop*, October 2002, Baltimore, USA.
9. *Gordon Conference on Polymer Physics*, August 2002 in Newport, Rhode Island. Title: Molecular Dynamics Simulations of a Filled Polymer Melt.
10. *American Institute of Chemical Engineers*, November 2001 in Reno, USA. Talks: (1) Simulation of a nanofilled polymer melt and (2) Predicting thermophysical properties of fluids by molecular simulation – plenary session, presented by A.M. Chaka.
11. *4th International Discussion Meeting on Relaxations in Complex Systems*, June 2001 in Hersonissos, Crete. Title: Local structure and dynamics of a cooled polymer melt.
12. *American Physical Society*, March 2001 in Seattle, USA. Session Chair: Nanoparticle Filled Systems. Talks: (1) Molecular Dynamics Simulations of a Nanoparticle in a Polymer Melt and (2) Local Structure, Mobility, and Vitrification of a Polymer Melt.
13. *Materials Research Society*, November 2000 in Boston, USA. Title: Molecular Dynamics Simulations of a Filled Polymer Melt.
14. *American Chemical Society*, August 2000 in Washington, DC, USA. Title: Dynamics of a Simulated Filled Polymer Melt.
15. *Gordon Conference on Water and Aqueous Solutions*, August 2000 in New Hampshire. Title: Phase Diagram, Energy Landscape, and Dynamics of Simulated Water.
16. *Gordon Conference on Polymer Physics*, August 2000 in New London, Connecticut. Title: Molecular Dynamics Simulations of a Filled Polymer Melt.

17. *American Physical Society*, March 2000 in Minneapolis, USA. Session Chair: Classical Fluids and Thermodynamics. Talks: (1) Structure and Dynamics in Simulated Filled Polymers and (2) Dynamics and Energy Landscape of Liquid Water.
18. *International Bunsen Discussion Meeting on Metastable Water*, September 1999 in Nordkirchen, Germany. Title: Dynamics and Energy Landscape of Liquid Water.
19. *Unifying Concepts in Glass Physics*, September 1999 in Trieste, Italy. Title: Dynamics and Energy Landscape of Liquid Water.
20. *Phase space and energy landscapes in disordered systems*, June 1999 at CECAM in Lyon, France.
21. *Workshop on Non-equilibrium Phenomena in Supercooled Fluids, Glasses, and Amorphous Materials*, September 1998 in Pisa, Italy. Title: Dynamics and Inherent Structures of Liquid Water.
22. *Gordon Conference on Water and Aqueous Solutions*, August 1998 in New Hampshire. Titles: (1) Dynamics of Water and the Energy Landscape (2) Continuity of Liquid and Glassy Water: Structural Evidence (3) presented by M. Yamada - Effect of Solutes on the Liquid-Liquid Transition of Simulated Water.
23. *StatPhys 20*, July 1998 in Paris. Title: Continuity of Liquid and Glassy Water.
24. *Hydration Processes in Biology* (NATO-ASI), May 1998 in Les Houches, France. Title: Continuity of Liquid and Glassy Water: Structural and Dynamic Evidence.
25. *78th Statistical Mechanics Conference*, December 1997 at Rutgers University. Title: Effect of Pressure on the Local Structure of Liquid Water.
26. Provided a simulation for *Super-Computing 97*, November 1997 in San Jose, California. Title: Stretched Liquid Water: Finite Size Effects.
27. *Gordon Conference on the Chemistry and Physics of Liquids*, August 1997 in New Hampshire. Title: Effect of Pressure on Liquid Water.
28. *Sixth International Conference on Discrete Models for Fluid Mechanics*, August 1996 at Boston University. Title: Interface Roughening in a Hydrodynamic Lattice-Gas Model with Surfactant.
29. *Gordon Conference on Water and Aqueous Solutions*, August 1996 in New Hampshire.

8 Miscellaneous Honors, Awards, and Activities

1. Research articles (29, 34, 41), (48) cited more than 100 times each.
2. Research articles (25, 31, 38, 39, 37, 42, 43, 45, 47, 46, 49) cited more than 50 times each.
3. Article 2 featured as the cover of *Polymer* volume 51, issue 15 (12 July 2010).
4. Article 3 featured as the cover of *Macromolecules* volume 43, issue 7 (13 April 2010).
5. Simulation image featured in “Water Molecules, Unite!”, *Physical Review Focus* **19**, story 19 (18 June 2007).
6. Member of the editorial board of the *Journal of Computational and Theoretical Nanoscience* 2003-2006
7. Best poster, Gordon Conference on Water and Aqueous Solutions, August 2006; co-authors M. Mazza, N. Giovambattista, and H.E. Stanley.
8. Research article (18) selected by editors for the IoP Select special collection of journal articles (<http://Select.iop.org>), June 2006.
9. Simulation images featured as the cover of “Soft Materials: Structure and Dynamics.” Edited by J.R. Dutcher and A.G. Marangoni (Marcel Dekker, N.Y., 2004).
10. Research articles (9), (15) and (25) selected to appear in the *Virtual Journal of Nanoscale Science & Technology*.
11. Research articles (9) and (11) selected to appear in the *Virtual Journal of Biological Physics Research*.
12. Computer simulation images featured in *Physics Today* **46**, 40-46. (2003).
13. Computer simulation images featured in *Nature* **409**, 400-401 (2001).
14. Recipient of a NIST/NRC Postdoctoral Associateship, August 1999 - August 2001.
15. Recipient of a NSF Graduate Research Trainee Fellowship, 1996 - 1999.
16. Computer simulation images featured on the cover of the MRS Bulletin, May 1999

17. Recipient of a NSF awards to attend CECAM workshops in July 1999 and July 2006.
18. Recipient of a NSF award to attend StatPhys 20 in July 1998, and StatPhys 22 in June 2004.
19. Recipient of a NSF award to attend NATO-ASI “Hydration Processes in Biology”, May 1998.
20. Member of the American Physical Society since 1999.
21. Member of the American Institute of Chemical Engineers 2001-2003.
22. Recipient of the Pugh Undergraduate Scholarship for Physics at Carnegie Mellon University: 1991 and 1992.