Itai Cohen Curriculum Vitae

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Citizenship: USA

Education:

University of Chicago, PhD Physics, graduated 2001
University of California at Los Angeles, **BS** Physics, Summa Cum Laude 1995

Research Appointments:

July 2005–present Assistant Professor in the Department of Physics and Laboratory of Atomic and Solid State Physics (LASSP) at Cornell.
2002–2005 Post Doctoral Researcher in **Dr. David Weitz's lab** – Studying complex fluids including colloids and liquid crystals. Developing rheometry and imaging techniques for these studies.
1996–2001 Graduate Research Assistant in **Dr. Sidney Nagel's lab** – Studied fluid dynamics and interface motion in two fluid systems.
1992–1995 Undergraduate Research Assistant in **Dr. Daniel Kivelson's lab** – Discovered a new phase transition in triphenyl phosphite, a super cooled liquid.

Patents:

Itai Cohen, Sidney R. Nagel, Horacio Rilo, Milan Mrksich, "Encapsulating particles with coatings that conform to size and shape of the particles," U.S. Patent Number 6,558,665 (May 6, 2003).

Mark Buckley, Itai Cohen, "Tissue deformation device for the investigation of depth dependent material properties." (In Review)

Leif Ristroph, Gordon Berman, Attila Bergou, Jane Wang, Itai Cohen "Hull Reconstruction Motion Tracking (HRMT) method for extracting wing and body kinematics from movies of insect flight." (In Review)

Publications:

1. A. Ha, **I. Cohen**, X. L. Zhao, M. Lee, T. Fischer, M. J. Strouse, and D. Kivelson, Supercooled Liquids and Polyamorphism, *J. Phys. Chem.* **100**, 1 (1996).
2. **I. Cohen**, A. Ha, X. L. Zhao, M. Lee, T. Fischer, M. J. Strouse, and D. Kivelson, A Low-Temperature Amorphous Phase in a Fragile Glass-Forming Substance, *J. Phys. Chem.* **100**, 8518 (1996).
3. D. Kivelson, J. C. Pereda, K. Luu, M. Lee, H. Sakai, A. Ha, **I. Cohen**, and G. Tarjus, Facts and Speculation Concerning Low-T Polymorphism in Glass Formers, in **Supercooled Liquids: Advances and Novel Applications**, ACS Books (1997); pp. 224-232.

4. **I. Cohen**, M. P. Brenner, J. Eggers, and S. R. Nagel, The Two Fluid Drop Snap-Off Problem: Experiments and Theory, *Phys. Rev. Lett.* **83**, 1147 (1999).
5. **I. Cohen** and S. R. Nagel, Testing for scaling behavior dependence on geometrical and fluid parameters in the two fluid drop snap-off problem, *Physics of Fluids* **13**, 3533 (2001).
6. **I. Cohen**, H. Li, J. L. Hougland, M. Mrksich, and S. R. Nagel, Using Selective Withdrawal to Coat Microparticles, *Science* **292**, 265 (2001).
7. **I. Cohen** and S. R. Nagel, Scaling at the Selective Withdrawal Transition, *Phys. Rev*. L*ett.* **88**, 074501 (2002).
8. P. Doshi, **I. Cohen**, W. W. Zhang, M. Siegel, P. Howell, O. Basaran, S. R. Nagel, Persistence of memory in drop breakup: The breakdown of universality, *Science* **302**, 1185 (2003).
9. **I. Cohen**, Scaling and transition structure dependence on the fluid viscosity ratio in the selective withdrawal transition, *Phys. Rev. E* **70,** 026302 (2004).
10. **I. Cohen**, T. G. Mason, D. A. Weitz, Shear-Induced Configurations of Confined Colloidal Suspensions, *Phys. Rev. Lett.* **94**, 46001 (2004).
11. P. Schall, **I. Cohen**, D. A. Weitz, F. Spaepen, Visualization of Dislocation Dynamics in Colloidal Crystals, *Science* **305**, 1944 (2004).
12. P. Schall, **I. Cohen**, D. A. Weitz, F. Spaepen, Visualizing dislocation nucleation by indenting colloidal crystals, *Nature* **440,** 319 (2006).
13. P. Schall, **I. Cohen**, D. A. Weitz, and F. Spaepen, Dynamics of dislocations in thin colloidal crystals, in **Nanomechanics of materials and structures**, editors: T. J. Chuang, P. M. Anderson, M. Wu, Dordrecht Springer (2006); pp. 255-261.
14. **I. Cohen**, B. Davidovitch, M. P. Brenner, D. A. Weitz, Visualizing shear bands in colloidal crystals under oscillatory shear, *Phys. Rev. Lett.* **97**, 215502 (2006).
15. M. R. Buckley, J. P. Gleghorn, L. J. Bonassar, **I. Cohen**, Mapping the depth dependence of shear properties in articular cartilage, J. Biomech. **41**, 2430-7 (2008).
16. S. J. Gerbode, S. Lee, C. Liddell, **I. Cohen**, "Restricted dislocation motion in crystals of colloidal dimer particles", *PRL* **101**, 058302 (2008).
17. S. Lee, S. J. Gerbode, B. Jahn, F. Escobedo, **I. Cohen**, C. Liddell, "Synthesis and Assembly of nonspherical hollow silica colloids under confinement" *J. Mater. Chem.* DOI: 10.1039/B812406J (2008).
18. M. Klein Berkenbusch, **I. Cohen**, and W. W. Zhang, "Liquid interfaces in viscous straining flows: numerical studies of the selective withdrawal transition", JFM **613,** 171 (2008)
19. L. G. Ristroph, G. J. Berman, A. J. Bergou, J. Wang, **I. Cohen**, Using automated hull reconstruction motion tracking (HRMT) to study sideways maneuvers of free-flying insects, JEB (Accepted 2009)
20. J. R. Savage, M. Caggioni, P. Spicer and **I. Cohen**, Partial universality: pinch-off dynamics in fluids with smectic liquid crystalline order *PRL* (Submitted)

Invited Seminars & Colloquia:

1. University of Chicago, Depts. of Physics and Computer Science (2000)
2. Massachusetts Institute of Technology, Dept. of Applied Mathematics (2000)
3. University of Chicago, Depts. of Physics and Computer Science (2001)
4. UC Irvine, Dept. of Physics (2001)

5. ExxonMobile Research and Engineering Company (2001)
6. Princeton University, Dept. of Physics (2001)
7. Jawaharlal Nehru Center, Dept. of Engineering Mechanics (2001)
8. India Institute of Science, Dept. of Physics (2001)
9. Clark University, Dept. of Physics (2002)
10. Harvard University, Division of Engineering and Applied Science (2002)
11. University of Maryland, Dept. of Physics (2003)
12. Massachusetts Institute of Technology, Dept. of Mechanical Engineering (2003)
13. Georgia Institute of Technology, Dept. of Physics (2003)
14. Georgia Institute of Technology, Dept. of Mathematics (2003)
15. Johns Hopkins University, Dept. of Physics (2003)
16. New York University, Courant Institute (2003)
17. UCSB, Dept. of Chemical Engineering (2003)
18. California Institute of Technology, Dept. of Chemical Engineering (2003)
19. UCLA, Depts. of Physics and Chemistry (2003)
20. ExxonMobile Research and Engineering Company (2003)
21. University of Chicago, Depts. of Physics and Computer Science (2003)
22. Georgia Institute of Technology, Dept. of Physics (2003)
23. Universite Montpellier II, Dept. of Physics (2003)
24. Universite Paris-Sud XI, The Laboratoire de Physique des Solides (2003)
25. Stanford, Dept. of Chemical Engineering (2004)
26. University of Oregon, Dept. of Physics (2004)
27. Emory, Dept. of Physics (2004)
28. MIT, Dept. of Physics (2004)
29. CCNY, The Levich Institute (2004)
30. Cornell, Dept. of Physics (2004)
31. Brandeis, Dept. of Physics (2004)
32. Cornell, Dept. of Physics (2004)
33. Cornell, Dept. of Chemical Engineering (2004)
34. University of New Mexico, Dept. of Mechanical Engineering (2004)
35. Sandia National Labs (2004)
36. Universitat Mainz, Dept. of Physics (2004)
37. Universitat Konstanz, Dept. of Physics (2004)
38. Universitat Dusseldorf, Dept. of Physics (2004)
39. Utrecht University, Depts. of Physical Chemistry and Physics (2004)
40. India Institute of Science, Dept. of Physics (2005)
41. Jawaharlal Nehru Center, Dept. of Engineering Mechanics (2005)
42. University of Massachusetts at Amherst, Dept. of Physics (2005)
42. Procter and Gamble Corporation, Industrial Research Headquarters (2005)
43. Arizona State University Dept. Physics and Astronomy (2005)
44. Rochester Institute of Technology, Dept. Physics (2005)
45. Cornell University, Dept. of Theoretical and Applied Math (2006)
46. University of Pennsylvania, Dept. of Physics and Astronomy (2006)
47. Syracuse University, Dept. of Physics (2006)
48. Yale University, Dept. of Mechanical Engineering (2006)
49. Florida State University, Dept. of Chemistry (2006)
50. University of Chicago, Dept. of Physics (2007)

51. U. of Illinois at Urbana Champaign, Dept. of Mechanical Engineering (2007)
52. Mount Holyoke, Dept. of Physics (2007)
53. New York University, Dept. of Math (2007)
54. New York University, Dept. of Physics (2007)
55. Georgetown University, Dept. of Physics (2008)
56. University of Chicago, Dept. of Physics (2008)
57. Rush Medical University, Dept of Orthopedics (2008)
58. Tulane, Dept. of Mechanical Engineering (2008)
59. University of Ottowa, Dept. of Physics (2008)
60. Academia Sinica (Taiwan), Dept. of Physics (2008)
61. National Taiwan University (Taiwan), Dept. of Physics (2008)
62. National Central University (Taiwan), Dept. of Physics (2008)
63. National Tsing Hua University (Taiwan), Dept. of Physics (2008)
64. University of Maryland, Dept of Physics (2009)
65. University of Massachusetts, Dept. of Physics (2009)

Invited Conference Talks:

1. Nonlinear Analysis 2000 & beyond, Courant Institute, NYU (2000)
2. IMA "Hot Topics" workshop: Analysis and Modeling of Industrial Jetting Processes, Cosponsored by MIT, U. Minn., UC Davis (2001)
3. Singularities in Eulerian Dynamics. Inst. Phys. Sci. & Tech., University of Maryland (2003)
4. APS Division of Condensed Matter Physics, March Meeting (2004)
5. Gordon Research Conference (GRC) on Complex Fluids (2004)
6. Statistical Physics of Complex Systems, Los Alamos summer workshop (2004)
7. 2nd International Shear Symposium, Universitat Mainz (2004)
8. New England Complex Fluids Workshops, quarterly meetings (2005)
9. Workshop on Driven States in Soft and Biological Matter, Abdus Salam International Centre for Theoretical Physics (ICTP) (2006)
10. SFAC 2006 International Workshop: Bridging Nanoscale Forces and Interfacial Phenomena to the Macroscopic World (Mexico) (2006)
11. Optical Society of America, LS XXII Annual Meeting, (2006)
12. Polymer Outreach Program, Cornell (2007)
13. IURMS – ICAM Bangalore India (2007)
14. IMA Summer Program on Singularities, University of Minnesota (2008)
15. New York Complex Matter Workshop, Cornell University (2008)
16. APS Division of Condensed Matter Physics, March Meeting (2008)

Invited Public Lectures:

1. Grade school science outreach lecture (2003)
2. GK-12 nanotech program for teachers (2004)
3. Boston Museum of Science – Series of nine lectures (2004)
4. Mount Carmel College (India), Dept. of Science (2005)
5. Keynote address, "Squishy Matter", at the Region 3 High School Science Conference "Hands-on and Minds-on Science: Educating the Scientists of Tomorrow" Queens NY (2005)

6. Keynote address, “Squishy Matter”, GK-12 continuing teacher education Cornell (2006)
7. CCMR Industrial Outreach Plenary speaker (2006)
8. 4-H Club “Fun Talk” (2006)
9. REU “Fun Talk” (2006)
10. Keynote address, “Squishy Matter”, GK-12 outreach New York City (2007)
11. Lecture, “Squishy Matter”, Sciencenter, Ithaca (2007)

Contributed Conference Talks:

1. American Physical Society March Meeting (1998)
2. American Physical Society March Meeting (1999)
3. American Physical Society March Meeting (2000)
4. Special Meeting on Complex Fluids, Monterey, CA (2000)
5. International Congress of Theoretical and Applied Mechanics, (2000)
6. Material Research Society, Fall meeting (2002)
7. New England Statistical Mechanics Meeting (2002)
8. New England Complex Fluids Workshops, quarterly meetings (2002-2004)
9. American Physical Society March Meeting (2003)
10. American Physical Society Division of Fluid Dynamics Meeting (2003)
11. American Physical Society March Meeting (2004)
12. American Physical Society March Meeting (2005)
13. American Physical Society March Meeting (2007)
14. American Physical Society Division of Fluid Dynamics Meeting (2007)
15. American Physical Society March Meeting (2008)
16. Society of Rheology Meeting (2008)
17. American Physical Society Division of Fluid Dynamics Meeting (2008)
18. Society for Comparative and Integrative Biology Meeting (2009)
19. American Physical Society March Meeting (2009)

Posters:

1. “Singularity formation at two fluid interfaces” MRSEC poster session (2000)
2. “Shear banding in colloidal suspensions” Symposium in honor of Chaikin and Lubensky (2005)
3. “Mapping the Depth Dependence of Shear Properties in Articular Cartilage” ORS Meeting (2007)
4. “Mapping the Frequency Dependence of the Depth Dependent Shear Properties in Articulat Cartilage” ORS Meeting (2008)
5. CCMR Polymer Outreach Program Symposium (2007, 2008)
6. Orthopedic Research Society Meeting (2008)

Organized Conferences and Workshops:

1. Organize semiannual New York Complex Matter Workshop with Abe Stroock at Cornell, Mark Bowick, Jennifer Schwarz, Christina Marchetti at Syracuse University, and George Thurston at RIT . These workshops bring together researchers from universities and industry in the upstate NY area. The participating industrial and academic institutions include Corning, GE, Kodak,

Syracuse University, University of Rochester, Rochester Institute of Technology, Clarkson, Colgate, and Cornell University, (2005 – Present)

2. 60th birthday celebration in honor of Sidney Nagel, Chicago (2008)

Postdoctoral Fellows Supervised:

2006–**2009** Rajesh Ganapathy (Now at JNC Bangalore India)
2006–**Present** Jonathan McCoy
2007–**Present** John Savage

Graduate Students Supervised:

2005–**Present** Sharon Gerbode
2005–**Present** Mark Buckley
2006–**Present** Leif Ristroph
2007–**2008** Matt Farrar
2008–**2009** Michael Turk

Undergraduate Students Supervised:

2006–**2007** Angie Wolfgang
2006–**2007** Jonathan Sobota
2006–**Summer** Erica Pratt
2006–**Summer** Jalina Keeling
2007–**2009** Brad Lyon
2007–**2009** Kirk Jensen
2007–**Present** Witat Fakcharoenphol
2007–**Summer** Andrew Potter
2008–**Summer** Jillian Kiser
2008–**Summer** Catherine Coumes
2008–**Present** Desmond Ong

Helped Supervise:

2003–**2005** Andrew Utada, graduate student – microfluidic devices.
2002 Gregorio Monge, undergraduate student – liquid crystal drop breakup.
1999–**2001** Drew Gifford, undergraduate student – drop breakup.

Awards:

2001 Graduating Students Lecture Prize – U. Chicago lecture competition
2000 MRSEC Poster Prize – Poster competition
1996 Gregor Wentzel – U. Chicago Physics graduate student teaching prize
1995 E. Lee Kinsey Outstanding Graduating Senior Award – Awarded to the top student graduating from the UCLA Physics Department
1995 Phi Beta Kappa – Scholarship given to five academically outstanding seniors
1994 UCLA Alumni Distinguished Scholar Award
1994–**1995 Barry M. Goldwater Scholar** – National scholarship selecting 200 students out of 1,200 students nominated by the faculties of universities nationwide
1994–**1995 Ella Okern** – Academic achievement scholarship
1993–**1994 Ballard** – Scholarship

Honor Societies:

1994 Phi Beta Kappa, Golden Key
1992 Alpha Lambda Delta, Phi Eta Sigma

Other Employment:

2001-Present Consultant: P&G, Harrick Scientific.
1995–2000 MRSEC outreach – Displayed a physics exhibit at the Nature Museum in Chicago; acted as consultant for industrial companies located in the Chicago area; conducted tours for grade school children visiting the Physics Department.
1995–1996 Teaching assistant at the University of Chicago Physics Department.
1991–1995 Tutor for UCLA Physics Department.
1992–1993 Student Health Advocate – Acted as a liaison between UCLA Student Health and students living in the dormitories.
1990–1991 Hebrew teacher at Temple Isaiah, Lafayette, CA.

Manuscript Referee:

1. Physics Review Letters (1997 – Present)
2. Physics of Fluids (1998 – Present)
3. Physics Review E (2000 – Present)
4. Journal of Fluid Mechanics (2006 – Present)
5. PNAS (2008 – Present)

Grant Proposal Reviewer:

1. Petroleum Research Fund ACS (2005 - Present)
2. NSF Division of Materials Research (DMR) (2006 - Present)
3. U.S. Civilian Research and Development Foundation (2006- Present)
4. Leaders Opportunity Fund, Canada (2008 – Present)

Consultant:

1. Hydron Technologies (2004-2005)
2. Harrick Scientific (2007-Present)
3. Procter and Gamble (2008-Present)

Selected Press Coverage:

1. "Drop break-up" Exhibit display Kersten Physics Teaching Center (1996)
2. "A droplet falling from a nozzle" *Kochi Newspaper*, Japan (Sept. 20, 1999)
3. "Watching the Faucet Drip" *Physical Review Focus*, **4,** story 9 (1999)
4. Sarah Tomlin, "Lights, camera, drip," *Nature* news and views, **400**, 715 (1999)
5. Barbara Grant, "Camera Zips While Drops Drip," *Photonics Spectra*, **34**, 162 (2000)
6. Photograph of drop breakup described in "The Two Fluid Drop Snap Off Problem: Experiments and Theory," appeared on APS calendar 2000, abstract index for March meeting (2000), and *Phys. Rev. Focus* advertisement 2005
7. "Shrink-wrapped cells dodge the immune system" *The Economist*, June 21, (2001)

8. "Discovery could lead to new ways to create nano-fibers and wires" *Purdue news*, *Newswise*, *Spacedaily* (2003)
9. "Nanofibers evolving from drop break-up" *Roland Piquepaille's Technology Trends* (2003)
9. "Dislocation dynamics" This week in Science, *Science*, **305**, 1869 (2005)
10. "Squishiness in everyday things" Cornell Chronicle, April 18 (2008)
11. "Flight of the fruit fly" interview for "All in a day" CBC broadcast (2008)

References:

David A. Weitz, Harvard U., Div. Eng. & App. Sci. & Phys. weitz@deas.harvard.edu
Sidney R. Nagel, U. Chicago, Dept. Phys. s-nagel@uchicago.edu
Jacob N. Israelachvili, UCSB, Dept. Chem. Eng. & Mats. jacob@engineering.ucsb.edu
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