

Pietro Cicuta

Appointments and Education

2000-2003	Cambridge University	Ph.D. in Physics <i>Viscoelasticity of Insoluble Macromolecular Monolayers.</i>
1993-1999	Università degli Studi di Milano	Laurea in Physics, 110/110 cum laude <i>Fluctuations of an Interface Between Two Fluid Phases in Equilibrium and Non-Equilibrium Conditions.</i>
2006-present	Lecturer in Physics	Cavendish Laboratory, Cambridge, UK
2004-2007	Oppenheimer Research Fellow	Cavendish Laboratory, Cambridge, UK
Oct. 2005	Visiting Researcher	Chem. Eng. Dept., Stanford University, USA
2003-2004	Postdoctoral Research Associate	Nanotechnology I.R.C., Cambridge, UK
Oct. 2002	Visiting Student	Chem. Eng. Dept., Stanford University, USA
2000-2003	Research Student, EPSRC	Cavendish Laboratory, Cambridge, UK
1998-1999	Undergraduate Laurea project	Department of Physics, Milan, Italy

Management responsibilities

Graduate student supervision:	2 PhD successfully completed; 8 current PhD students.
Post-doctoral supervision:	currently 3 PDRA, 2 of which co-supervised.

Committee membership

Biological Physics Group of Institute of Physics, 2010 to date.
Management Committee of the Systems Biology degree course at Cambridge, 2009 to date.

Contribution to education training

Examinations of PhD candidates: 8 UK, 1 Slovenia, 1 Italy, 1 Spain.
Course: Soft Condensed Matter and Biophysics - 22 lectures, Part II Physics. 07/08 to date.

Head of Class:	1B labs - Optics and Waves- Physics	06/07.
Head of Class:	1A labs - Physics	09/10, to date.
Supervision:	1A Physics	08/09, to date.
Supervision:	Thermal and Statistics Physics	07/08, to date.
Director of Studies:	Physics in Corpus Christi College	07/08, to date.
Examiner:	Part II Physics	08, 09, 10.
Examiner:	Part IB Physics	12.

Organisation of Meetings

- Physics of Medicine kickoff meeting, DAMTP Cambridge 2007.
- BSS Theme Day, Cambridge 2007.
- Cavendish-Engineering-Addenbrookes joint Imaging Symposium, RCUK Cambridge 2009.
- LMB-Cavendish BioMembrane Workshop, PoM Cambridge 2009.
- Photonic Tools: Marker-free Imaging and Optical Manipulation, IoP London, 7 December 2009.
- Workshop on Thermal Instabilities in Fluids, Cambridge 21 January 2011.
- Quantitative Methods in Gene Regulation, IoP London, 22-23 September 2011.

Administration / Community

College - admission interviews 2008-2011.
College - Research Fellowship Committee (acting secretary for 2009, 2010, 2011 non-stipendiary competitions).
Department - Graduate Admission Committee 2008-current

Invited Lectures and Talks

1. Physics Department Seminar, June 2002, University of Milan, Italy.
2. Physics Department Seminar, July 2003, University of Parma, Italy.
3. Fluids Surfaces and Interfaces, November 2004, New Hall College, Cambridge.
4. Physics Department Seminar, October 2005, Simon Fraser Univ., Vancouver, Canada.

5. Chemistry Department Seminar, October 2005, Univ. of Washington, Seattle, U.S.A.
6. Physics Department Seminar, November 2005, University of Exeter, Exeter, U.K.
7. BP Institute Seminar, November 2005, University of Cambridge, Cambridge, U.K.
8. International Symposium on Food Rheology and Structure, February 2006, Zurich, CH.
9. Chemical Engineering Department Seminar, March 2006, University of Naples, Italy.
10. Department Seminar at the Veterinary School, October 2006, Cambridge University.
11. DAMTP Fluids Seminar, January 2007, Cambridge University.
12. IoP Active Membrane meeting, July 2007, London
13. Polymer Physics Group meeting, Sept 2007, Durham
14. Nanoscience Center department seminar, November 2007, San Sebastian, Spain.
15. Chemistry Department seminar, November 2007, University of Hull.
16. Invited speaker at Physics of Living Matter symposium, November 2007, Cambridge.
17. Physics Department seminar, November 2007, University of Leeds.
18. Food Science Department seminar, March 2008, Milan Italy.
19. BP Institute meeting, June 2008, Cambridge.
20. Chemistry Department seminar, November 2008, University of Bristol.
21. Soft Matter and Biological Physics, April 2009, Warwick.
22. Physical Chemistry Department seminar, May 2009, University of Oxford.
23. Chemistry Department seminar, May 2009, Imperial College London.
24. National Congress of Statistical Physics, June 2009, Parma, Italy.
25. Invited speaker at Slonano- Nanotechnology meeting, October 2009, Ljubljana, Slovenia.
26. Department seminar, Curie Institute, February 2010, Paris.
27. Physics Department seminar, March 2010, University of Surrey.
28. Invited speaker at Mechanical Energy Conversion in Small Systems, March 2010, Leeds.
29. Physics Department seminar, March 2010, University of Bari, Italy.
30. Physics Department seminar, June 2010, University of Montpellier, France.
31. Invited speaker at Italian Biophysical Society meeting, September 2010, Arcidosso, Italy.
32. Invited speaker at CMMP10, December 2010, Warwick.
33. Nokia Research Labs seminar, Cambridge, December 2010
34. Physics Department seminar, March 2011, University of Durham.
35. OSA meeting, April 2011, Monterey, USA
36. Physics Department seminar, May 2011, University of Oxford.
37. Invited speaker at complex interfaces workshop, September 2011, Lorentz Center, NL.

Reviewer for scientific journals

Phys. Rev. Lett.; Phys. Rev. E; Nature; Biophysical J.; Langmuir; J. Biophotonics; Optics Express; Biomacromolecules; Mathematical Biosciences; Nanotechnology; Food Hydrocolloids; J. Phys. Chem; J. Optics A; Rheological Acta; Macromolecules; Experiments in Fluids; BBA-Biomembranes; Acta Biomaterialia; J.Non-Crystalline Solids.

Grants current

- PI CASE studentship Unilever (2008-2011).
- PI CASE studentship Kodak (2008-2011).
- Co-I HFSP Research Project grant, (2009-2012), PI for £300K (grant total \$1.2M).
- Co-I EU Training Network "Comploids" (2009-2012), £4M.
- Co-I EU Training Network "Transpol" (2010-2013), £3.2M.

Grants recent

- PI Royal Society International Joint project, (2009-2010) £12K.
- PI MRC discipline hopping award, (2009-2010) £100K.
- PI Biophysics section of KAIST-Cavendish Research Collaboration, (2008-2010).
- Co-I IRC Nanotechnology Exploratory Project (2003-2004) £100K.
- Oppenheimer Research Fellowship (2004-2007) £150K.
- Co-I EPSRC Research Grant (Life Sciences Interface) (2006-2007) £97K.
- PI Unilever Research Grant, (2006-2008) £30K.

Peer reviewed publications

- [1] P. Cicuta, A. Vailati, M. Giglio, Equilibrium and nonequilibrium fluctuations at the interface between two fluid phases, *Phys. Rev. E* 62 (2000) 4920.
- [2] P. Cicuta, A. Vailati, M. Giglio, Capillary to bulk crossover of nonequilibrium fluctuations in the free diffusion of a near-critical binary liquid mixture, *Appl. Optics* 40 (2001) 4140.
- [3] P. Cicuta, I. Hopkinson, Studies of a weak polyampholyte at the air-buffer interface: The effect of varying pH and ionic strength, *J. Chem. Phys.* 114 (2001) 8659.
- [4] P. Cicuta, I. Hopkinson, P. G. Petrov, Photocontrol of protein conformation in a Langmuir monolayer, *J. Chem. Phys.* 115 (2001) 9991.
- [5] P. Cicuta, I. Hopkinson, Dynamic light scattering from colloidal fractal monolayers, *Phys. Rev. E* 65 (2002) 041404.
- [6] P. Cicuta, A.R. Tajbakhsh, E.M. Terentjev, Evolution of photonic structure on deformation of cholesteric elastomers, *Phys. Rev. E* 65 (2002) 051704.
- [7] L. Cristofolini, P. Cicuta, M.P. Fontana, Looking for the glass transition in a single molecular layer on the water surface, *J. Phys.: Condensed Matter* 15 (2003) S1031.
- [8] P. Cicuta, E.J. Stancik, G.G. Fuller, Shearing or compressing a soft glass in 2d: Time-Concentration superposition, *Phys. Rev. Lett.* 90 (2003) 236101.
- [9] P. Cicuta, I. Hopkinson, Recent developments of surface light scattering as a tool for optical-rheology of polymer monolayers, *Colloids and Surfaces A: Physicochem. Eng. Aspects* 233 (2004) 97.
- [10] P. Cicuta, A.R. Tajbakhsh, E.M. Terentjev, Photonic gaps in cholesteric elastomers under deformation, *Phys. Rev. E* 70 (2004) 011703.
- [11] P. Cicuta, I. Hopkinson, Scaling of dynamics in 2d semi-dilute polymer solutions, *Europhys. Lett.* 68 (2004) 65.
- [12] P. Cicuta, E.M. Terentjev, Viscoelasticity of a protein monolayer from anisotropic surface pressure measurements, *European Phys. J. E* 16 (2005) 147.
- [13] T.A.M. Ferenczi, P. Cicuta, Shear and compression viscoelasticity in polymer monolayers, *J. Phys.: Condens. Matter* 17 (2005) S3445.
- [14] P. Cicuta, Compression and Shear surface rheology in spread layers of β -casein and β -lactoglobulin, *J. Coll. Interface Sci.* 308 (2007) 93.
- [15] P. Cicuta, S.L. Keller, S.L. Veatch, Diffusion of liquid domains in lipid bilayer membranes, *J. Phys. Chem. B* 111, (2007) 3328.
- [16] P. Cicuta and A.M. Donald, Microrheology: A review of the method and applications, *Soft Matter* 3 (2007) 1449.

- [17] A. R. Honerkamp-Smith, P. Cicuta et al. , Line tensions, correlation lengths, and critical exponents in lipid membranes near critical points, *Biophys. J.* (2008) 95 236.
- [18] S. L. Veatch, P. Cicuta et al., Critical Fluctuations in Plasma Membrane Vesicles, *ACS Chem. Biol.*; (Letter); 3 (2008) 287.
- [19] Y.-Z. Yoon, J. Kotar, G. Yoon and P. Cicuta, Non-linear mechanical response of the Red Blood Cell, *Physical Biology* 5 (2008) 036007.
- [20] M. Leoni, J. Kotar, B. Bassetti, P. Cicuta, M. Cosentino Lagomarsino, A basic swimmer at low Reynolds number, *Soft Matter* 5 (2009) 472 – 476.
- [21] D. Vella and P. Cicuta, Granular character of particle rafts, *Phys. Rev. Lett.*, 102, (2009) 138302
- [22] E. Spigone G.-Y. Cho, G.G. Fuller and P. Cicuta, Surface rheology of a polymer monolayer: effects of polymer chain length and compression rate, *Langmuir* 25 (2009), 7457–7464
- [23] Y.Z.Yoon, H.Hong, A.Brown, D.C.Kim, D.J.Kang, V.L.Lew, P.Cicuta, Flickering analysis of erythrocyte mechanical properties: dependence on oxygenation level, cell shape and hydration level, *Biophys. J.*, 97, (2009) 1606–1615.
- [24] A. Laohavisit, A.T. Brown, P. Cicuta and J.M. Davies, Annexins - Components of the calcium and reactive oxygen signaling network, *Plant Physiology*, 152 (2010) 1824–1829.
- [25] Y.- Z. Yoon, J.P. Hale, P. G. Petrov and P. Cicuta, Mechanical properties of ternary lipid membranes near a liquid–liquid phase separation boundary, *J. Phys.: Condens.Matter* 22 (2010) 062101.
- [26] M. Leoni, B. Bassetti, J. Kotar, P. Cicuta and M. Cosentino Lagomarsino, Minimal two-sphere model of the generation of fluid flow at low Reynolds numbers, *Phys. Rev. E* 81 (2010) 036304.
- [27] Y.-Z. Yoon and P. Cicuta, Optical trapping of colloidal particles and cells by focused evanescent fields using conical lenses, *Optics Express* 18 (2010) 7076.
- [28] J. Kotar, M. Leoni, B. Bassetti, M. Cosentino Lagomarsino and P. Cicuta, Hydrodynamic synchronization of colloidal oscillators, *PNAS* 107 (2010) 7669.
- [29] N.Osterman, J.Kotar, E.M. Terentjev and P.Cicuta, Relaxation kinetics of stretched disclination lines in a nematic liquid crystal, *Phys. Rev. E* 81, 061701 (2010)
- [30] G.M. Cicuta, J.Kotar, A.T. Brown, J.-H.Noh and P.Cicuta, Hydrodynamic coupling in polygonal arrays of colloids: Experimental and analytical results, *Phys. Rev. E* 81, 051403 (2010)
- [31] J.M.A. Mauritz, A.Esposito, T.Tiffert, J.N. Skepper, A.Warley, Y.-Z. Yoon, P.Cicuta, V.L. Lew, J.R. Guck and C.F. Kaminski, Biophotonic techniques for the study of malaria-infected red blood cells, *Medical and Biological Engineering and Computing* 48, 1055-1063 (2010)
- [32] Y.-Z. Yoon, J.Kotar, A.T. Brown and P.Cicuta, Red blood cell dynamics: from spontaneous fluctuations to non-linear response, *Soft Matter* 7, 2042 (2011)

- [33] E.Aumaitre, D.Vella and P.Cicuta, On the measurement of the surface pressure in Langmuir films with finite shear elasticity, *Soft Matter* 7, 2530 (2011)
- [34] W.-A.Bauer, J.Kotar, P.Cicuta, R.Woodward, J.Weaver and W.T.S. Huck, Microfluidic production of monodisperse functional o/w droplets and study of their reversible pH dependent aggregation behavior, *Soft Matter* 7, 4214 (2011)
- [35] A.T. Brown, J. Kotar and P. Cicuta, Active rheology of phospholipid vesicles, *Phys. Rev. E* 84, 021930 (2011)
- [36] N.Bruot, L.Damet, J.Kotar, P.Cicuta and M. Cosentino Lagomarsino, Noise and Synchronization of a Single Active Colloid, *Physical Review Letters* 107, 094101 (2011)
- [37] E.Aumaitre, S.Wongsuwarn, D.Rossetti, N.D. Hedges, A.R. Cox, D.Vella and P.Cicuta, A viscoelastic regime in dilute hydrophobin monolayers, *Soft Matter*, to appear (2012)
- [38] G.M. Cicuta, E.Onofri, M. Cosentino Lagomarsino and P. Cicuta, Patterns of synchronization in the hydrodynamic coupling of active colloids, *Phys. Rev. E*, to appear (2012)