

Shiladitya Banerjee, Ph.D.

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| CONTACT INFORMATION | Physics and Astronomy E20 University College London Gower Street London WC1E 6BT, UK | Phone (Office): +44 0207 679 7295 E-mail: shiladitya.banerjee@ucl.ac.uk |
| EMPLOYMENT | University College London, Department of Physics & Astronomy Institute for the Physics of Living Systems Principal Investigator | 2016 - present |
| | University of Chicago, James Franck Institute Postdoctoral Scholar | 2013 - 2016 |
| | Syracuse University, Department of Physics Research Assistant | 2009 - 2013 |
| EDUCATION | Syracuse University , Syracuse, NY, USA Ph.D., Physics, 2013 Thesis: "Cell Mechanics: From cytoskeletal dynamics to tissue-scale mechanical phenomena" Advisor: M. Cristina Marchetti Area: Soft Matter Theory and Biological Physics | 2008 - 2013 |
| | Chennai Mathematical Institute , Chennai, India B.Sc. (Honors), Physics , 2008 | 2005 - 2008 |
| HONORS AND AWARDS | <ul style="list-style-type: none">• Strategic Fellowship, Institute for the Physics of Living Systems, University College London (2016-2019).• Kharasch Travel Award for Postdoctoral Scholars, Department of Chemistry, University of Chicago (2016).• American Physical Society Prize for Outstanding Doctoral Thesis Research in Biological Physics (2013).• Kadanoff-Rice Postdoctoral Fellowship, University of Chicago, NSF Materials Research Science and Engineering Center (2013-2015).• All-University Doctoral Prize, The College of Arts and Sciences, Syracuse University (2013).• American Physical Society March Meeting, Group on Statistical and Nonlinear Physics, best five student speakers (2012).• I2CAM Junior Travel Award (2010).• Gold Medal for Excellence in Physics, Chennai Mathematical Institute (2008). | |
| RESEARCH | <ul style="list-style-type: none">• Active Soft Matter• Actin Cytoskeleton• Bacterial Cell Physics• Cell Mechanics and Motility• Tissue Mechanics | |

PUBLICATIONS

21. S. Karki, **S. Banerjee**, M. Maienschein-Cline, H. Xu, E. Davis, P. Collins, M. Mandal, C. Labno, S.E. Powers, E. Oltz, H. Singh, M.M. Le Beau, A.R. Dinner and M.R. Clark, "Stochastic capture of chromatin topological domains by nuclear matrix RNA polymerase II determines monogenic choice", *submitted* (2016).
20. I. Linsmeier, **S. Banerjee**, P.W. Oakes, W. Jung, T.Y. Kim and M.P. Murrell, "Disordered Actomyosin Networks are Sufficient to Produce Cooperative and Telescopic Contractility", *Nature Communications In Press* (2016).
19. **S. Banerjee**, K. Lo, T. Kuntz, M. Daddysman, A.R. Dinner and N.F. Scherer, "Crossover in the dynamics of cell wall growth controls bacterial division times", *bioRxiv*, 047589 (2016).
18. J. Notbohm*, **S. Banerjee***, K.J.C. Utuje, B. Gweon, H. Jang, Y. Park, J. Shin, J. Butler, J.J. Fredberg and M.C. Marchetti, "Cellular contraction and polarization drive collective cellular motions", *Biophysical Journal* **110**, 2729 (2016). * equal contribution
17. W.G. Liang, C. Triandafillou, D.Y. Hwang, M.M.L. Zulueta, **S. Banerjee**, A.R. Dinner, S.C. Hung and W.J. Tang, "Structural basis for oligomerization and glycosaminoglycan binding of CCL5 and CCL3", *PNAS* **113**, 5000 (2016).
16. **S. Banerjee**, N.F. Scherer and A.R. Dinner, "Shape dynamics of growing cell walls", *Soft Matter* **12**, 3442 (2016).
15. **S. Banerjee**, K.J.C. Utuje and M.C. Marchetti, "Propagating Stress Waves During Epithelial Expansion", *Physical Review Letters* **114**, 228101 (2015). Featured in **Editor's suggestions**.
14. C.S. Wright*, **S. Banerjee***, S. Iyer-Biswas, S. Crosson, A.R. Dinner and N.F. Scherer, "Intergenerational continuity of cell shape dynamics in *Caulobacter crescentus*", *Scientific Reports* **5**, 9155 (2015). * equal contribution
13. E.J. Hemingway, A. Maitra, **S. Banerjee**, M.C. Marchetti, S. Ramaswamy, S.M. Fielding and M.E. Cates, "Active Viscoelastic Matter: from Bacterial Drag Reduction to Turbulent Solids", *Physical Review Letters* **114**, 098302 (2015).
12. P.W. Oakes, **S. Banerjee**, M.C. Marchetti and M.L. Gardel, "Geometry regulates traction stresses in adherent cells", *Biophysical Journal* **107**, 825 (2014). **Journal cover article**; Featured in **New and Notable**.
11. **S. Banerjee**, R. Sknepnek and M.C. Marchetti, "Optimal shapes and stresses in adherent cells on patterned substrates", *Soft Matter* **10**, 2424 (2014).
10. **S. Banerjee** and L. Giomi, "Polymorphism and bistability in adherent cells", *Soft Matter* **9**, 5251 (2013).
9. **S. Banerjee** and M.C. Marchetti, "Controlling cell-matrix traction forces by extracellular geometry", *New Journal of Physics* **15**, 035015 (2013). Featured in **Highlights of 2013**.
8. A.F. Mertz, Y. Che, **S. Banerjee**, J. Goldstein, S. Revilla, C. Niessen, M.C. Marchetti, E.R. Dufresne and V. Horsley, "Cadherin-Based Intercellular Adhesions Organize Epithelial Cell-Matrix Traction Forces", *PNAS* **110**, 842 (2013). Recommended by **F1000 Prime**.
7. **S. Banerjee** and M.C. Marchetti, "Contractile Stresses in Cohesive Cell Layers on Finite-Thickness Substrates", *Physical Review Letters* **109**, 108101 (2012).

6. G.K. German, W.C. Engl, E. Pashkovski, **S. Banerjee**, Y. Xu, A.F. Mertz, C. Hyland and E.R. Dufresne, "Heterogeneous Drying Stresses in *Stratum Corneum*", *Biophysical Journal* **102**, 2424 (2012).
5. A.F. Mertz, **S. Banerjee**, Y. Che, G. German, Y. Xu, C. Hyland, M.C. Marchetti, V. Horsley and E.R. Dufresne, "Scaling of Traction Forces with the Size of Cohesive Cell Colonies", *Physical Review Letters* **108**, 198101 (2012). Featured in **Editor's suggestions**.
4. **S. Banerjee**, T.B. Liverpool and M.C. Marchetti, "Generic phases of cross-linked active gels: Relaxation, oscillation and contractility", *Europhysics Letters* **96**, 58004 (2011).
3. **S. Banerjee** and M.C. Marchetti, "Substrate rigidity deforms and polarizes active gels", *Europhysics Letters* **96**, 28003 (2011).
2. **S. Banerjee**, M.C. Marchetti and K.K. Müller-Nedebock, "Motor-driven dynamics of cytoskeletal filaments in motility assays", *Physical Review E* **84**, 011914 (2011).
1. **S. Banerjee** and M.C. Marchetti, "Instabilities and oscillations in isotropic active gels", *Soft Matter* **7**, 463 (2011).

ADDITIONAL PUBLICATIONS

1. **S. Banerjee**, "Cell Mechanics : From cytoskeletal dynamics to tissue-scale mechanical phenomena", *Physics - Doctoral Dissertations*, Paper 131, Syracuse University (2013).

INVITED TALKS

- *Quantitative Biology of Cytoskeletal Mechanics* Workshop, Chicago, USA. 2015
- University College London, MRC Laboratory for Molecular Cell Biology. 2015
- University of Bristol, Department of Applied Mathematics, Bristol, UK. 2015
- *Computations in Science* seminar, University of Chicago, Chicago, IL, USA. 2015
- Chennai Mathematical Institute Alumni Conference, Chennai, India. 2015
- APS March Meeting, Denver, CO, USA 2014
- Symposium on *Active Matter and the cytoskeleton*.
- Program on *Active Matter: Cytoskeleton, cells, tissues and flocks* 2014
- Kavli Institute of Theoretical Physics, Santa Barbara, CA, USA.
- *Dynamics of suspensions, gels, cells and tissues*, 2013
- Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.
- APS March Meeting, Baltimore, MD, USA. 2013
- Symposium on *From cells to tissues: the material properties of living matter*.
- Squishy Physics Seminar, Harvard University, USA. 2013
- Biophysics Seminar, Lewis-Sigler Institute, Princeton University, USA. 2012
- Seminar, TIFR Center for Interdisciplinary Sciences, Hyderabad, India. 2012
- GSNP Student Speaker Award talk, APS March Meeting, Boston, MA, USA. 2012
- Condensed Matter and Biological Physics Seminar, Syracuse University, USA. 2011
- Theoretical Physics Seminar, Stellenbosch University, South Africa. 2010

CONTRIBUTED PRESENTATIONS

- International conference on Active and Smart Matter, Syracuse, NY (Talk). 2016
- Gordon Research Conference on *Self Assembly and Active Matter*, New London, NH, USA. (Poster) 2015
- Workshop on Soft|Meta matter, University of Chicago, USA. 2014
- APS March Meeting, Baltimore, MD, USA. (Talk) 2013
- 13th New York Complex Matter Workshop, Syracuse University, USA. (Talk) 2012
- APS March Meeting, Boston, MA, USA. (Talk) 2012

- Gordon Research Conference, New London , NH, USA. (Poster) 2011
Soft Matter Far from Equilibrium
- 11th New York Complex Matter Workshop, Syracuse University, USA. (Talk) 2011
- APS March Meeting, Dallas, TX, USA. (Talk) 2011
- Workshop on Active Materials, Stellenbosch, South Africa. (Talk) 2010
- 10th New York Complex Matter Workshop, Cornell University, USA. (Talk) 2010
- 9th New York Complex Matter Workshop, RIT, Rochester, USA. (Talk) 2009
- Boulder School for Condensed Matter Physics, UC Boulder, USA. (Poster) 2009
- Summer school on *Soft Solids and Complex Fluids*, UMass Amherst, USA. 2009
- ICAM Conference on Soft Active Materials, Syracuse University, USA. (Talk) 2009

TEACHING

University College London

- PHASM800/PHASG800: Molecular Biophysics Spring 2017

Syracuse University

- PHY 531: Thermodynamics and Statistical Mechanics Spring 2013
- PHY 360: Vibrations, Waves and Optics Fall 2012
- PHY 305: Solar Energy Science and Architecture Fall 2012
- PHY 312: Relativity, Cosmology and Beyond Spring 2011, 2012
- PHY 221: General Physics I: Mechanics Spring 2009
- PHY 222: General Physics II: Electricity, Magnetism and Light Fall 2008

SERVICE

- **Organizer**, *Computations in Science Seminar*, The University of Chicago (2014-2016).
- **Organizer and chair**, APS March Meeting 2015 invited symposium: *From bacteria to eukaryotes: shape organization in living matter*.
- **Manuscript Referee**: Nature Communications, Physical Review Letters, Physical Review E, Biophysical Journal, New Journal of Physics, Physical Biology, Nature Scientific Reports, Europhysics Letters, European Physical Journal E, BBA Molecular Cell Research.
- **Member**, American Physical Society (2008 - present).

REFERENCES

Prof. M. Cristina Marchetti, mcmarche@syr.edu

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Prof. Aaron R. Dinner, dinner@uchicago.edu

Department of Chemistry, James Franck Institute and Institute for Biophysical Dynamics, University of Chicago, Chicago, IL 60637, USA.

Prof. Margaret L. Gardel, gardel@uchicago.edu

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