PRAGYA SRIVASTAVA

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Research interests

- Physics of biological systems, Quantitative Biology, Memory formation in biological systems;
- Soft & Active Matter, Complex fluids, Non-equilibrium stat. mechanics, Dynamical systems.

Work History

Postdoctoral Research Associate – Nov. 2015 to Present
Advisor – Dr. Guillaume Salbreux
The Francis Crick institute, London, NW1 1AT, UK.

- Developed analytical frameworks and computational tools aimed at advancing quantitative understanding of biological processes, such as cell division and cellular response to a variety of intrinsic and extrinsic perturbations.
- Led scientific discussions on a diverse range of topics in social science, cognitive neuroscience, game theory and complexity science.

Postdoctoral Research Associate – Jul. 2013 to May 2015.
Advisor – Prof. Cristina Marchetti
Physics Department, Syracuse University, Syracuse, NY-13244, USA

- Developed theoretical frameworks to model collective behaviour of complex fluids to advance understanding of a variety of experiments ranging from extracts of living cells to cell layers and bacterial suspensions.

Teaching Assistant: Advanced course on " *Polymers and Membranes*" – Jan. 2011 to Apr. 2011.
National Center for Biological Sciences – Bengaluru, India

- Prepared requisite material and designed tutorials.
- Organised bridging lectures and led problem solving sessions for a class consisting of students from diverse educational backgrounds and skill sets.

Education

Doctorate in Physics (Awarded in 2014)
Raman Research Institute – Bengaluru, India
Thesis title: "*Active Mechanics of Cortical Actin : Geometry and Shape Deformation*"
Advisor – Prof. Madan Rao

Master of Science: Physics, July 2005 to June 2007.
Jawaharlal Nehru University – New Delhi, India
Graduated with a GPA 8.2/10 (equivalent to 4.0 using standard conversion), 2^{nd} rank in the class.

Bachelor of Science: Physics, Mathematics, & Chemistry, July 2002 to May 2005.
University of Allahabad – Allahabad, India
Graduated with 79 % (equivalent to 4.0 using standard conversion), 1^{st} rank in the university.

Technical Skills

- Programming: Matlab, Mathematica, Fortran, Python, shell scripting
- Data analysis & visualisation: Matlab, Python, ImageJ, Jupyter
- High-performance computing, version control (Git), Linux containers & virtualization
- Software and packages: MS-office Suite, Adobe illustrator, LaTeX
- Operating Systems : Linux, MacOS, Windows

Awards & Achievements

- Awarded Nature Travel Grant to attend Gordon Research Conference and Seminar on Soft Condensed Matter Physics, August 17-23, 2013.
- Qualified for Junior Research Fellowship by Council for Scientific and Industrial Research in December 2007.
- Recipient of University Grants Commission Scholarship for university rank holders from July 2005- July 2007 (First rank in the university).
- Felicitated by Ministry of Education Uttarakhand, India in 2002 for securing first rank in the state of Uttarakhand (2002).

Publications

1. **A nonequilibrium force can stabilize 2D active nematics**,
   Ananyo Maitra, Pragya Srivastava, M. Cristina Marchetti, Juho Lintuvuori, Sriram Ramaswamy and Martin Lenz,
   Proceedings of the National Academy of Sciences, 201720607(Jun 2018).
2. **Polymertropism of rod-shape bacteria: movement along aligned polysaccharide fibers**,
   David J. Lemon, Xingbo Yang, Pragya Srivastava, Yan-Yeung Luk and Anthony G. Garza,
   Sci. Rep. **7**, 7643 (2017).
3. **Negative Stiffness and Modulated States in Active Nematics**,
   Pragya Srivastava, Prashant Mishra and Cristina Marchetti,
   Soft Matter, **12**, 8214(2016).
4. **Activating Membranes**,
   Ananyo Maitra, Pragya Srivastava, Madan Rao and Sriram Ramaswamy,
   Phys. Rev. Lett. **112**, 258101(2014).
5. **Patterning of polar active filaments on a tense cylindrical membrane**,
   Pragya Srivastava, Roie Shlomovitz, Nir Gov and Madan Rao,
   Phys. Rev. Lett. **110**, 168104(2013).
6. **Cylindrical Cellular Geometry Ensures Fidelity of Division Site Placement in Fission Yeast**,
   Mithilesh Mishra, Yinyi Huang, Pragya Srivastava, Ramanujam Srinivasan, Mayalagu Sevugan, Roie Shlomovitz, Nir Gov, Madan Rao, and Mohan Balasubramanian,
   Journal of Cell Science, **125**, 3850(2012).
7. **Textured domains on tense surfaces and membranes: Effect of tilt and chirality** ,
   R.C. Sarasij, Pragya Srivastava and Madan Rao,
   Phys. Rev. E **85**, 041920 (2012).

Talks

1. Computational and Physical Biology Seminar, May 2, 2018,
   The Francis Crick Institute, 1 Midland Road, NW1 1AT, London
   Talk Titled : *Autonomous mechanism of orienting cell divisions*
2. Computational and Physical Biology Workshop, December 5, 2016,
   The Francis Crick Institute, 1 Midland Road, NW1 1AT, London
   Talk Titled : *Living Cell as a Poroelastic Material*
3. ICTS, September-2015, Bangalore, India
   Talk title : *Instabilities and patterns in an active nematic film*

4. National Centre for Biological Sciences, September-2015, Bangalore, India
   Talk title : *Instabilities and patterns in an active nematic film*
5. Jawaharlal Nehru University, August -2015, New Delhi, India
   Talk title : *Instabilities and Patterns in Active Systems : Effects of Substrate Friction, Geometry and Shape Fluctuations*
6. ICAM Annual Conference, May 11-13, 2015,
   Argonne National Laboratory, IL-60439, USA
   Talk title : *Instabilities and patterns in an active nematic film*
7. The Francis Crick Institute, March 10-12, 2015, Lincon's Inn Fields, London,UK
   Talk title : *Instabilities and Patterns in Active Systems : Effects of Substrate Friction, Geometry and Shape Fluctuations*
8. APS Meeting, March 2-6, 2015, San Antonio, Texas
   Talk Titled : *Instabilities and patterns in an active nematic film*
9. APS Meeting, March 3-7, 2014, Denver, Colorado, USA
   Titled : *Axi-symmetric patterns of active polar filaments on spherical and composite surfaces*
10. Condensed Matter and BioPhysics Seminar, September 13, 2013
    Physics Department, Syracuse University, Syracuse, NY-13244, USA
    Titled : *Active Mechanics of Cortical Actin : Geometry and Shape Deformation*
11. Visit to Institute of Mathematical Sciences, March 27, 2013-March 30, 2013,
    Chennai, India.
    Titled : *Patterns of active polar filaments on curved membrane surfaces and active deformation of the cell membrane*
12. ICAM : Emergent order in Biology, July 23,2012- August 4, 2012, IESC, France.
    Titled : *Patterns of active polar filaments on cylindrical and spherical cells*.
13. Visit to Prof. Gerhard Gompper's group, August 4, 2012-August 8, 2012,
    Forschungszentrum, Julich, Germany.
    Titled : *'Patterns of active polar filaments on cylindrical and spherical cells'*.

Posters

1. EMBO conference on Quantitative Principles in Biology, November 2, 2017- November 4, 2017,
   Heidelberg, Germany. Poster titled : *An autonomous mechanism for guiding the spindle through mitotic rounding.*
2. Physics of Living Matter Symposium, 11th Edition, September 2016, Cambridge, UK Poster titled : *Living Cell as a Poroelastic Material*
3. Gordon Research Conference and Seminar on Soft Condensed Matter Physics,
   August 17-23, 2013, Colby Sawyer College, New London, NH.
   Poster titled : *Instabilities and waves in the leading edge of moving and spreading cells.*
4. Visit to Institute of Mathematical Sciences, March 27, 2013-March 30, 2013,
   Chennai, India.
   Talk titled : *Patterns of active polar filaments on curved membrane surfaces and active deformation of the cell membrane*
5. ICAM : Emergent order in Biology, July 23,2012- August 4, 2012, IESC, France.
   Talk titled : *Patterns of active polar filaments on cylindrical and spherical cells*.
6. Visit to Prof. Gerhard Gompper's group, August 4, 2012-August 8, 2012,
   Forschungszentrum, Julich, Germany.
   Talk titled : *'Patterns of active polar filaments on cylindrical and spherical cells'*.

7. 'Unifying Concepts in Materials: JA Krumhansl School & Symposium', January 30, 2012 - February 08, 2012.
   Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore &
   National Centre for Biological Sciences, Bangalore.
   Poster titled : *Patterns of active polar filaments on curved geometries*.

Confererences & Workshops

1. EMBO conference on Quantitative Principles in Biology,
   November 2, 2017- November 4, 2017, Heidelberg, Germany.
2. Computational and Physical Biology, December 5, 2016,
   The Francis Crick Institute, 1 Midland Road, NW1 1AT, London.
3. Physics of Living Matter Symposium, 11th Edition, September 2016, Cambridge, UK.
4. Circle Meeting, May 8-10, 2016, Paris, France.
5. American Physical Society Meeting March 2-6, 2015
   San Antonio, Texas, USA.
6. Active Matter : Cytoskeleton, Cells, Tissues and Flocks, Jan 6- May 16, 2014,
   Kavli Institute for Theoretical Physics, University of California, Santa Barbara, USA.
7. American Physical Society Meeting March 3-7, 2014
   Denver, Colorado, USA.
8. Gordon Research Conference and Seminar on Soft Condensed Matter Physics,
   August-2013, Colby Sawyer College, New London, NH.
9. ICAM : Emergent order in Biology, July-2012, IESC, France.
10. 'Unifying Concepts in Materials: JA Krumhansl School & Symposium', January-2012
    Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore &
    National Centre for Biological Sciences, Bangalore.
11. Advanced School on Living Mechanics - Cells, Tissues and Organisms,
    November-2010, National Center for biological Sciences, Bangalore, India.
12. Conference and School on Nucleation Aggregation and Growth,
    July-2010, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India.
13. ICTS Program on Non-Equilibrium Statistical Physics, January-2010,
    Indian Institute of Technology, Kanpur, India.