Sabyasachi Sutradhar

Curriculum Vitae

Personal Details

Address: 564 Prospect St., Apt A3,
New Haven,CT, 06511, USA
Date of birth: March 21, 1985
Nationality: Indian
Marital Status: Married, 1 child

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Education

Doctor of Philosophy in Physics 2010 - 2016
Calcutta University, Kolkata, WB, India; **Computational Biophysics**

Master of Science in Physics 2005 - 2008
Burdwan University, Burdwan, WB, India; Specialization: **Solid State Physics**, 1^{st} class

Bachelor of Science in Physics 2002 - 2005
Burdwan University, Sainthia, WB, India; Major: **Physics**; Minor: Math, Chem, 1^{st} class

Research Experience

Postdoctoral researcher
Howard Lab, Yale University, New Haven, CT, USA 2016-present
Adviser: *Prof. Jonathon Howard*

- Computational modeling of *Drosophila* Class IV **neuronal morphogenesis**.
- **Tracking software** to track dendritic tip with sub-pixel accuracy.
- Software to measure **neuronal mesh properties**.
- Source code to understand **microtubule flexural rigidity**.

Doctoral researcher
Paul Lab, IACS, Kolkata, India 2010-2016
Adviser: *Prof. Raja Paul*

- Computational model for **Golgi Assembly** in *Saccharomyces cerevisiae*.
- Comprehensive computational model for **asymmetric mitotic cell division**.
- **Spring lattice model** to study cell proliferation and death.
- Source code to understand **microtubule mediated network formation**.

Masters researcher
Burdwan University, Burdwan, India 2005-2008
Adviser: *Prof. Pabitra Kumar Mallick*

- Surface Enhanced Raman Scattering.

Skills

- **Developments:** Source code to study *neuronal morphogenesis*, 'Matlab' code to *track dendritic tips*, Mechanistic computational model of *asymmetric cell division*, Source code to study *collective cell proliferation and apoptosis*.
- **Computational Algorithms:** *'Monte Carlo'* method and *Molecular Dynamics* simulation
- **Image Processing:** Matlab, ImageJ.
- **Programming Languages:** C, MatLab, Python, Shell Scripting, LaTeX
- **Softwares:** Matlab, Mathematica, ImageJ, Photoshop, Illustrator, ROCKS cluster, etc.
- **Communicating medium:** English, Bengali (native), Hindi (Native).

Fellowships & Awards

- Recipient, Travel award, Physical Biology of the Cell, (Sep 18 - Oct 8, 2016), MBL, Woods Hole, MA, USA
- Recipient, Junior Research Fellowship & Senior Research Fellowship by Council of Scientific and Industrial Research, New Delhi, India (2009 & 20012).
- Recipient, Graduate Aptitude Test in Engineering, 2008.
- Recipient, State Eligibility Test, 2008.

Mentorship

- Mentored undergraduate student Kebron Gurara; Topic: *Mathematical methods for characterizing dendrite arbors*
- Mentored undergraduate student Daniel Friedman; Topic: *Bayesian Inference in Dynamic Instability of Neuronal Dendritic tips.*

Teaching

Teaching Assistant (Mathematical Physics), IACS during Doctoral Studies 2010-2015
Assistant Teacher (Physics), MAH High School, Hooghly, WB, India 2008-2010

Leadership

President, Research Scholars' Association, IACS 2014-2015
Editor, cultural magazine Wriddhi 2013-2015

Professional Development

- **Workshops:**
  - **Parallel Computing with MATLAB**: April 4, 2018, YCRC, Yale University, CT,USA
  - **Virtual Cell Workshop**: Jun 12 - 14, 2017, U. Conn. Med. School, Farmington, CT, USA.
  - **Physical Biology of the Cell**, Sep 18 - Oct 8 2016, MBL, Woods Hole, MA, USA.
  - **Unifying Concepts in Materials: JAK School & Symposium** 2012, JNCASR & NCBS, India.
- **Conferences & Posters:**
  - **BPS 2022**: Feb, 2022, , San Francisco, CA, USA.
  - **BPS 2020**: Feb, 2020, , San Diego, CA, USA.
  - **Yale Day of Data**: Nov, 2018, Yale University, New Haven, CT, USA.
  - **Gordon Research Conference**: Stochastic Physics in Biology, Jan , 2017 Ventura, CA, USA.
  - **Indo-French Conference on Frontiers in Cytoskeleton Research**, Oct, 2015, IISER Pune, India.
  - **Interdisciplinary approach to biological sciences**, Feb, 2015, IACS, Kolkata, India.
  - **Chromosome Stability** 2014, Dec, 2014, JNCASR, Bangalore, India.
  - **Statphys - Kolkata VIII** 2014, Dec, 2014, SNBNCBS, Kolkata, India.
  - **Cell Mechanics Meeting**, Jan, RRI, Bangalore, India.
  - **Conference on Chromosome Stability**, Dec, 2012, Thiruvanantapuram, India.
  - **An Interdisciplinary approach to soft-matter & biological physics**, Dec 2011, IACS, Kolkata, India.
- **Oral Presentations:**
  - **"Dynamic Instability of Dendritic tips Generates Complex Neuronal Morphologies"**, Sep 10, 2021, Science Hill RIP talk, Yale University, New Haven, USA
  - **"Tip dynamics shape branching morphology in class IV neurons"**, Oct 25, 2019, PEB/QBio retreat talk solicitation, Yale University, New Haven, USA
  - **"Modeling mitosis in computer"**, February 11, 2016, IACS, Kolkata, India
  - **"Stochastic simulation quantifying cell division and mechanics"**, November 24, 2015, Deaprtment of Physics, CU, Kolkata, India
  - **"Regulation of kinetochore-microtubule dynamics plays important role in budding yeast chromosome positioning"**, Cell Mechanics Meeting, January 31, 2013, RRI, Bangalore, India

Invited Talks

- **"Self-organization in Biology"**, February 28, 2022, Department of Science, Barasat College, WB, India.
- **"Deciphering the Dendritic Tip Dynamics of *Drosophila* Class IV Sensory Neuron"**, February 22, 2018, Department of Mechanical Engineering & Materials Science, Yale University, New Haven, USA

Publications

1. O. Glomb, G. Swaim, P.M. LLancao, C. Lovejoy,, **S. Sutradhar** , J. Park, Y. Wu, M. Hammarlund, J. Howard, S. M. Ferguson, S. Yogev, Scaled-expansion of the membrane associated cytoskeleton requires conserved kinesin adaptors, ***bioRxiv***, (2022)
2. S. Shree†, **S. Sutradhar**† , O. Trottier, Y. Tu, X. Liang and J. Howard, Dynamic Instability of Dendrite Tips Generates the Highly Branched Morphologies of Sensory Neurons, ***accepted Science Advances***, *(2022)*, †Equal authors
3. R. Basak, **S. Sutradhar** and J. Howard, Focal Laser Stimulation of Fly Nociceptors Activates Distinct Axonal and Dendritic Ca^{2+} Signals, ***Biophys. J.*** *(120 1-12), (2021)*
4. S. Chattetjee, **S. Sutradhar**, S. Puri and R. Paul, Ordering kinetics in a q-state random-bond clock model: Role of vortices and interfaces, ***Phys. Rev. E*** *101, 032128 (2020)*
5. P. Iyer, **S. Sutradhar**, R. Paul and D. Bhattacharyaya, A novel combinatorial approach of quantitative microscopy and *in silico* modeling deciphers Arf1-dependent Golgi size regulation, ***The Euro. Phys. J. E*** *42, 1-9 (2019)*
6. S. Basu, **S. Sutradhar** and R. Paul, Substrate stiffness and mechanical stress due to intercellular cooperativity guides tissue structure, ***J. of Theor. Biol.*** *457, 124-136 (2018)*
7. S. Basu, S. Majumder, **S. Sutradhar**, S. K. Das and R. Paul, Phase segregation in a binary fluid confined inside a nanopore, ***Europhys Lett.*** *116 (5), 56003, (2017)*
8. G. E. Thomas, K. Bandopadhyay, **S. Sutradhar**, P. Singh, K. K. Gireesh, S. Simon, Renjith MR, B. Badarudeen, M. Banerjee, R. Paul, J. Mitra, and T. K. Manna, EB1 regulates attachment of Ska1 with microtubules by forming extended structures on the microtubule lattice, ***Nat. Comm.***, *7, 11665, (2016)*
9. **S. Sutradhar**, S. Basu, R. Paul, Inter-centrosomal angular separation during mitosis plays a crucial role for maintaining spindle stability, ***Phys. Rev. E*** 92, 4, 1547–1558 (2015).
10. **S. Sutradhar**†, V. Yadav†, S. Sridhar, L. Sreekumar, D. Bhattachryya, S. K. Ghosh, R. Paul, K. Sanyal, A comprehensive model to predict mitotic division in budding yeasts, ***Mol. Biol. of the Cell*** August 26, 22, 3954-3965 (2015). Cover Article,†Equal authours.
11. S. Sau, **S. Sutradhar**, R. Paul, P. Sinha, Budding Yeast Kinetochore Proteins , Chl4 and Ctf19 , Are Required to Maintain SPB-Centromere Proximity during G1 and Late Anaphase, ***PLoS One*** 9, 7, e101294 (2014).
12. **S. Sutradhar**, R. Paul, Tug-of-war between opposing molecular motors explains chromosomal oscillation during mitosis, ***J. of Theor. Biol.*** 344, 56–59 (2013).

May 30, 2022