Preeti Sahu

Curriculum Vitae

Hannezo Group, Central Building
Institute of Science and Technology,
Am Campus 1, 3400,
Klosterneuberg, Austria

+43 677 6399 3804
preeti.sahu@ist.ac.at
ORCID 0000-0003-1741-1642
DOB 9^{th} June 1992

Research Interests

Biophysical modelling of tissues– to predict compartmentalization in developing embryos and stem cellfate determination in adult skin tissues, and **S**tatistical physics of soft condensed matter systems

Education

- **Ph.D.** in Physics — Aug 2015- Aug 2020
  Syracuse University, Syracuse, New York, USA
  Grade Point Average (GPA)- 3.33/4.0
  Advisors- Prof. Lisa Manning, Prof. Cristina Marchetti and Prof. J. M. Schwarz
  Thesis- Fluidization and segregation in confluent models for biological tissues [Link]
- **Integrated B.Sc-M.Sc.** in Physics — Aug 2010- Jun 2015
  National Institute of Science Education and Research- Jatni, India
  Grade Point Average (GPA)- 8.3/10
  Advisor- Dr. A. V. Anil Kumar
  Dissertation- Phase separation in active brownian particles

Academic Appointments

- **Postdoctoral Researcher** in Prof. Edouard Hannezo's group — Jan 2021- present
  Institute of Science and Technology, Austria
- **Graduate Research Assistant** at Syracuse University, NY, USA — 2016- 2020
- **Graduate Teaching Assistant** at Syracuse University, NY, USA — 2015- 2016

Pre-prints and Publications

1. **Preeti Sahu**, J. M. Schwarz and M. Lisa Manning "Geometric signatures of tissue surface tension in a three-dimensional model of confluent tissue", submitted, 2021, arxiv.org/abs/2102.05397.

2. **Preeti Sahu***, Janice Kang*, Gonca Erdemci-Tandogan and M. Lisa Manning "Linear and nonlinear mechanical responses can be quite different in models for biological tissues", accepted in Soft Matter, 2020, DOI: 10.1039/C9SM01068H. [Link]

3. **Preeti Sahu**, Daniel M. Sussman, Matthias Rubsam, Aaron F. Mertz, Valerie Horsley, Eric R. Dufresne, Carien M. Niessen, M. Cristina Marchetti, M. Lisa Manning, and J. M. Schwarz "Small-scale demixing in confluent biological tissues" accepted in Soft Matter, 2020, DOI:10.1039/C9SM01084J. [Link]

4. **Preeti Sahu** "Interpolating solution in a mechanical model under quench" PRAYAS Student Journal of Physics. Vol 4 Number 6, (Jan- Mar. 2013) published by Indian Association of Physics Teachers [Link]
*equal contribution

Mentoring and Teaching Experience

Mentor for REU students of Prof. Lisa Manning — 2018, 2016

Teaching Assistant — 2015- 2016

- PHY 221: General Physics Laboratory I — Spring & Fall 2016
- AST 101: Our Corner of the Universe — Fall 2015

Invited Talks

- *Role of neighbor exchange in fluidization and de-mixing of confluent tissues* — Mar 2019
  American Physical Society (APS) March Meeting, Boston, USA [Link]
- *Biomechanics of de-mixing and differentiation in confluent tissues* — Apr 2021
  Virtual interview for EMBO fellowship (awaiting decision) , at Prof. Xavier Trapat's group, IBEC, Spain

Conferences, Talks and Posters

Talks

Geometric signatures of tissue surface tension in a three-dimensional model of confluent tissue — Mar 2021
APS March Meeting (Online Meeting)

Signatures of tissue surface tension in 3D models with two tissue types — Mar 2020
APS March Meeting (via DSOFT Virtual Meeting)

Small-scale demixing in confluent cellular monolayers — Jan 2020
Princeton Center for Theoretical Science Workshop on **The Physics of Collective Cell Migration**- Princeton University, NJ, USA

Geometric signature of surface tension in confluent tissues — Dec 2019
Conference on **Recent Topics in Statistical Mechanics**, National Institute of Science Education and Research-Jatni, India

Role of morphological differences in cell sorting — Dec 2018
3rd International Conference on Soft Materials, Malaviya National Institute of Technology, Jaipur, India

Mechanical difference insufficient to create sorting in confluent mixtures — Mar 2018
APS March Meeting, Los Angeles, USA

Posters

Geometric signatures of tissue surface tension in 3D models with two tissue types — Jan 2020
Princeton Center for Theoretical Science Workshop on **The Physics of Collective Cell Migration**- Princeton University, NJ, USA

Geometric signature of surface tension in 3D tissues — Oct 2019
Biology and Physics Confront Cell-Cell Adhesion thematic meeting, Aussois, France

The search for physical mechanism of cell sorting in bidisperse confluent tissue — Feb 2018
Princeton Center for Theoretical Science Workshop on **Mechanics in Morphogenesis** - Princeton University, NJ, USA

Understanding how cells group together in confluent biological tissues — Feb 2017
Summer School on Soft Matter and Complex Fluids, University of Massachusetts, Amherst, USA

Understanding how cells group together in confluent biological tissues — Feb 2017
Stevenson Biomaterials Poster Session, Syracuse Biomaterials Institute, Syracuse University, NY, USA

Achievements

- 2021 - Awarded EMBO Long-term fellowship (Austria) for 2 years.
- 2020 - Feature talk at Princeton Center for Theoretical Science, Princeton University, NJ, USA. Title: Small-scale demixing in confluent cellular monolayers.
- 2019 - Invited talk in American Physical Society (APS) March meeting, Boston, USA. Title: Role of neighbor exchange in fluidization and de-mixing of confluent tissues.

- 2018 - Soft and Living Matter(SLM) travel grant of value $1000.
- 2014 - Received Khorana fellowship for an Indo-US summer exchange program at Indiana University, IN, USA for 10 weeks.
- 2011 - Generous fellowship by Govt. of India under Kishore Vaigyanik Protsahan Yojana for 4 years.

Computer Skills

Advanced Knowledge	C++ , MATLAB, GIT, LaTeX, Linux, Excel, Microsoft Windows, Graphic Design	**Intermediate Knowledge**	Fiji, Bash Scripting, Mathematica, Python, Imaris Inkscape

Undergraduate Summer Research Projects

Study Kinesin Conformational Change in apo-state 2014

Guide: Dr. Jared C Cochran, *Indiana University, IN, USA*

Diffusion in 1D and 2D 2013

Guide: Prof. Abhishek Dhar, *International Centre for Theoretical Sciences, Bangalore, India*

Interpolating solution in a mechanical model under quench 2012

Guide: Dr. Sudipta Mukherji, *Institute of Physics, Bhubaneswar, India*

A Study of Genetic Factors for Recurrent Pregnancy Loss 2011

Guide: Dr. Debasmita P. Alone, *National Institute of Science Education and Research, Jatni, India*

Non-academic Activities

1. 2021 - Virtual outreach on Career Counselling for high school students (advt) on June 28th 2021
2. 2020 - Amidst Covid-19, participated as a team along with 5 other researchers in Johns Hopkins University-CBID design challenge and our work (write-up) on social distancing in slums, dharavicovid got featured in JHU newsletter on April 3rd 2020
3. 2018- 20 President of Society for the Promotion of Indian Classical Music And Culture Amongst Youth (SPICMACAY) Syracuse chapter
4. 2016 - Active volunteer for Institute for Complex Adaptive Matter workshop on Smart and Active Matter, and APS Conference for UG Women in Physics (CUWIP) at Syracuse University

Languages

Hindi (Fluently spoken and written), English (Fluently spoken and written), Odiya (mother-tongue) and German (Beginner-A1)

References

Lisa Manning - Ph.D. advisor
Syracuse University
229-B, Dept. of Physics
Physics Building,Syracuse,
NY 13244, USA
mmanning@syr.edu
(: 315.443.3920)

J. M. Schwarz - Ph.D. advisor
Syracuse University
229-A, Dept. of Physics
Physics Building,Syracuse,
NY 13244, USA
jschwarz@physics.syr.edu
(: 315.443.3887)

Cristina Marchetti - Ph.D. advisor
Broida 6235, Dept. of Physics
University of California Santa Barbara,
CA 93106-9530, USA
cmarchetti@ucsb.edu
(: 805.893.5228)