CURRICULUM VITAE

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Postdoctoral Researcher,
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EDUCATION

Aug. 2014–Oct. 2019	**Ph.D.** in Computational and Theoretical Chemistry, Department of Chemistry, Indian Institute of Science Education and Research (IISER) Pune, India.
2011 – 2013	**M.Sc.** in Chemistry, Department of Chemistry, Indian Institute of Technology Kanpur, India.
2008 – 2011	**B.Sc. (Hons.)** in Chemistry *(with distinction)*, Department of Chemistry, Visva-Bharati University, Santiniketan, India.

RESEARCH EXPERIENCES

(Post–Ph.D.)

Sep. 2021 – present	**Postdoctoral Researcher,** Department of Biomedical Engineering, University of North Dakota. USA. **Project:** *Algorithms of estimating entropy production in active matter systems.* **Advisor:** *Prof. Jerome Delhommelle*.
Feb. 2020 – Jul. 2021	**Postdoctoral Researcher,** School of Chemistry, IISER Thiruvananthapuram, India-695551. **Project:** *Investigating the dynamics of organic chromophores in solvents through atomistic computer simulation.* **Advisor:** *Prof. Mahesh Hariharan.*
Oct. 2019 – Feb. 2020	**Research Fellow,** Department of Chemistry, IISER Pune, India-411008. **Project:** *Effect of solvents on polymer translocation through molecular dynamics simulation.* **Advisor:** *Dr. Srabanti Chaudhury*

(Ph.D. work)

Aug. 2014–Oct. 2019 **Thesis Title:** *Some aspects of non-equilibrium polymer translocation dynamics.*
Thesis Advisor: *Dr. Srabanti Chaudhury*

(Pre–Ph.D.)

Jul. 2013 – Jul. 2014 **Project Assistant,**
Polymers and Advanced Materials Laboratory,
CSIR-National Chemical Laboratory, Pune, Maharashtra, India,
Project: *Molecular dynamics study on the growth of carbon dioxide and methane hydrate from a seed crystal.*
Advisor: *Dr. Sudip Roy*

May 2012 – Jul. 2012 **Visiting Summer Project Student,**
School of Chemistry,
IISER Thiruvananthapuram, India-695551.
Project: *Molecular modelling of pyrene modified chromophores.*
Advisor: *Prof. Mahesh Hariharan*

PUBLICATIONS

1. **B. Ghosh**, Ilham Essafri, C. Desgranges, J. Delhommelle, Machine Learning and Active Fluids, (In preparation).

2. Ilham Essafri, **B. Ghosh**, C. Desgranges, J. Delhommelle, Designing and Realizing Active Fluids, (In preparation).

3. **B. Ghosh**, J. Sarabadani, S. Chaudhury, and T. Ala-Nissila, Pulling a folded polymer through a nanopore, **Journal of Physics: Condensed Matter**, 33, 015101, 2020. [link] [pdf]

4. **B. Ghosh**, and S. Chaudhury, Translocation dynamics of an asymmetrically charged polymer through a pore under the influence of different pH conditions, **The Journal of Physical Chemistry B**, 123, 4318-4323, 2019. [link] [pdf]

5. P. Nakate, **B. Ghosh**, S. Das, S. Roy, and R. Kumar, Molecular Dynamics Study on Growth of Carbon Dioxide and methane hydrate from a seed crystal, **Chinese Journal of Chemical Engineering**, 27, 2074-2080, 2019. **(*invited article*)**. [link] [pdf]

6. **B. Ghosh,** and S. Chaudhury, Influence of the location of attractive polymer–pore interactions on translocation dynamics, **The Journal of Physical Chemistry B**, 122, 360-368, 2018. [link] [pdf]

7. J. Sarabadani, **B. Ghosh**, S. Chaudhury, and T. Ala-Nissila, Dynamics of end-pulled polymer translocation through a nanopore, **Europhysics Letters**, 120, 38004, 2017. [link] [pdf]

8. **B. Ghosh**, and S. Chaudhury, Fluctuation theorems for total entropy production in generalized Langevin systems, **Physica A: Statistical Mechanics and its Applications,** 466, 133-139, 2017. [link] [pdf]

TEACHING EXPERIENCESS

2015 (Fall)	**Teaching Assistant** for Chemical Principles I (CHM 101), IISER Pune, Coordinator: Dr. Arnab Mukherjee,
2016 (Spring)	**Teaching Assistant** for Statistical Thermodynamics (CHM 422), IISER Pune, Coordinator: Dr. Srabanti Chaudhury,
2016 (Fall)	**Teaching Assistant** for Molecular Modelling and Simulation (CHM 436), IISER Pune, Coordinator: Dr. Arun Venkatnathan,

TALKS/CONFERENCES/WORKSHOPS

Invited Talks

- "Role of Polymer-Pore Interactions in Translocation dynamics" presented in "Soft Matter and Statistical Mechanics 2019", IISER Pune, India.
- "Role of Polymer-Pore Interactions in Translocation dynamics" presented in "Puri Polymer Conference 2018", Puri, India.
- "Influence of the Location of Attractive Polymer-Pore Interactions on Translocation Dynamics" presented in "Chemsymphoria", 2018, IISER Pune, India.

Poster Presentations

- "A comparative study of algorithms to find information entropy in equilibrium and non-equilibrium systems", 2022, APS Physics March Meeting 2022, Chicago, USA.
- "Self-organization in Active Matter: From Living Crystals to Cells and Living Systems", 2021, Annual North Dakota Biomedical Engineering Symposium, University of North Dakota, USA.
- "Polymer Translocation: A few Investigations from Computer Simulations" presented in "Hünfeld 2021: Workshop on Computer Simulation and Theory of Macromolecules", 2021, Max Planck Institute for Biophysical Chemistry, Goettingen, Germany.
- "Pulling a Folded Polymer through a Nanopore" presented in "Frontiers in Ion Channels and Nanopores: Theory, Experiments, and Simulations (FICN2021)", Sapienza University of Rome, Italy.
- "Role of Polymer-Pore Interactions in Translocation dynamics" presented in "Multi-scale Simulation & Mathematical Modelling of Complex Biological Systems 2019", Jawaharlal Nehru University, New Delhi, India.
- "Dynamics of End-pulled polymer Translocation Through a Nanopore" presented in "Society of Polymer Science, India, SPSI-MACRO 2018", IISER Pune, India.
- "Influence of the Location of Attractive Polymer-Pore Interactions on Translocation Dynamics" presented in "Recent Advances in Modeling Rare Events (RARE2017)", Agra, India.
- "End-pulled Polymer Translocation through a Nanopore" presented in "15th Indian Theoretical Chemistry Symposium", 2016, University of Hyderabad, India.
- "Entropy Production Theorems in Systems with Memory" presented in "Physical and Biophysical Chemistry Theory and Experiment", 2015, IIT Bombay, India.

Workshops

- Designed and instructed courses in the "Advanced Molecular Dynamics Simulation: A SAARC Regional Summer School 2021" to train undergraduates, graduate participants through hands-on sessions in Virtual Box, Linux Systems, Grace, gnuplot, scripting, MD in GROMACS.
- Volunteered in the inhouse "Molecular Modeling in Chemistry" workshop on Gaussian, Autodock, MOPAC, molecular modeling, December 2018, IISER Pune, India.

Participations

- "International Conference on Ultrafast Spectroscopy (ICUS2020)", 2020, IISER Thiruvananthapuram, India.
- "14th Indian Theoretical Chemistry Symposium", 2014, CSIR-NCL and IISER Pune, India.

REFERENCES

1. **Dr. Srabanti Chaudhury** (Thesis Advisor),
   Associate Professor,
   Department of Chemistry,
   Indian Institute of Science Education and Research Pune, Maharashtra,
   India-411008.
   E-mail: srabanti@iiserpune.ac.in
   Phone: +912025908140
   Website: *click url*

2. **Dr. Arnab Mukherjee,**
   Associate Professor,
   Department of Chemistry,
   Indian Institute of Science Education and Research Pune, Maharashtra,
   India-411008.
   E-mail: arnab.mukherjee@iiserpune.ac.in
   Phone: +912025908051
   Website: *click url*

3. **Prof. Jerome Delhommelle**,
   Associate Professor,
   Department of Biomedical Engineering,
   University of North Dakota,
   USA, ND-58202
   E-mail: jerome.delhommelle@und.edu
   Phone: +17017772495
   Website: *click url*

4. **Prof. Mahesh Hariharan,**
   Professor,
   School of Chemistry,
   Indian Institute of Science Education and Research Thiruvananthapuram, India-695551.
   E-mail: mahesh@iisertvm.ac.in
   Phone: +914712778101
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