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Hema Teherpuria

Pursuing Ph.D., Department of Physics, IIT Jodhpur

Email: hema.1@iitj.ac.in



Education

- 2020 – current  4th Year **Ph.D. student** at the Department of Physics, Indian Institute of Technology, Jodhpur
- 2016-2018  **M.Sc. Physics**, Guru Jambheshwar University Science and Technology, Hisar, Haryana.
- 2013-2015  **B.Sc. Physics**, Gargi College, Delhi University.

Related Course Work






1. Computational Material Science
2. Statistical Thermodynamics
3. Molecular Dynamics Simulations
4. Critical Phenomenon and Renormalization Group
5. Introduction to Soft Matter Physics

My Interest

My current study focuses on two independent but related areas: **Ion transport mechanisms in battery electrolytes and the effect of patterned substrates on phase-separating binary mixtures**, which are examined using molecular dynamics (MD) simulations. MD simulations play a key role in elucidating ion transport at the microscopic level in battery electrolytes because they provide insight into how ions behave in the electrolyte solution. These fields are significant for developing energy storage devices and understanding the basic ideas behind phase separation in materials science.

Supervisors: Dr. Santosh Mogurampelly and Dr. Prabhat K. Jaiswal

Skills

- Languages  Reading, writing, and speaking competencies in both English and Hindi.
- Coding  **MATLAB, Fortran, Python**
- Software  **GROMACS, LAMMPS, Ovito, VMD (Visual Molecular)**
- Plotting Tool  Xmgrace, Gnuplot, MATLAB, Origin
- Writing Tool  Microsoft PowerPoint, Microsoft Excel, Microsoft Word, Latex




Conferences and webinar

1. Participated (Poster Presentation) in the National Conference, **NC-EMAD IIT Jodhpur, India, 16-18 Dec. 2022.**
2. Participated in a 3-day National Webinar on Li-ion Batteries and Beyond - A Perspective for Future Energy Storage and Needs, **NIT Rourkela, India 2022.**
3. Participated (Oral Presentation) at National Conference, in Soft Matter: Young Investigators e-**SMYIM, India 2021.**
4. Participated in a Webinar on Atomistic Modelling and Simulation at the **Indian Institute of Technology, Kharagpur, India 2020.**
5. Participated (Poster Presentation) in a Structure and Dynamics of Chemical and Biomolecular Systems (SDCBS) at **IIT Kanpur, India 26-28 Oct. 2023.**
6. Participated (Poster Presentation) in a Compflu at **Indian Institute of Technology Madras, India 16-18 Dec. 2023.**
7. Participated in **MD@60 2024, 25 Feb. to 29 Feb. 2024.**



Research Publications

- 1 Sipra Mohapatra, **Hema Teherpuria**, Sapta Sindhu Paul Chowdhury, Suleman Jalilahmad Ansari, Prabhat K Jaiswal, Roland R. Netz, and Santosh Mogurampelly, “Ion transport mechanisms in pectin-containing EC–LiTFSI electrolytes”, *Nanoscale*, 2024, **16**, 3144 - 3159
- 2 **Hema Teherpuria**, Sapta Sindhu Paul Chowdhury, Sipra Mohapatra, Prabhat K Jaiswal, and Santosh Mogurampelly, “Diffusion and ion-ion correlations in EC-LiTFSI electrolytes”, conference proceeding in A **Springer book series Advances in Sustainability Science and Technology**, 2023.
- 3 **Hema Teherpuria**, Sapta Sindhu Paul Chowdhury, Prabhat K. Jaiswal, and Santosh Mogurampelly, “Salt Effects on Ionic Conductivity Mechanisms in Ethylene Carbonate Electrolytes: Interplay of Viscosity and Ion-ion Relaxations”, Under review in **Physical Review Letters**, 2024 (<https://arxiv.org/abs/2401.11182>).
- 4 **Hema Teherpuria**, Hitesh Yadav, Sipra Mohapatra, and Santosh Mogurampelly, “Polymer alignment induced changes in ion solvation structure in EC-LiTFSI electro”, Submitted in **Soft Matter**, 2024
- 5 Syed Shuja Hasan Zaidi, **Hema Teherpuria**, Santosh Mogurampelly, Prabhat K. Jaiswal, “Surface-directed spinodal decomposition on chemically patterned substrate: A molecular dynamics study”, Manuscript for checkboard substrate under preparation.

Awards and Achievements

- 2021  **Best Mini Talk Award**, Soft Matter: Young Investigators e-Meet 2021.
- 2020  GATE-MHRD Qualified, 2020. (Gate Score – 421).
- 2011  **Nominated for Kalpana Chawla Award, Board of School Haryana (10th class).**

Miscellaneous Experience

- 2020-....  Worked as a Teaching Assistant for Basic Physics Lab, instructing and guiding B.Tech. students through laboratory experiments.
- 2023  Volunteered for DST Vigyan Jyoti Program, inspiring and motivating female students to pursue education.

References

Dr. Santosh Mogurampelly

Associate Professor

Department of Physics

Indian Institute of Technology Jodhpur

Contact No. - +91 (0) 291 280 1613

Email - santosh@iitj.ac.in

Google Scholar Profile: <https://scholar.google.co.in/citations?user=UkqEItoAAAAJ&hl=en>

Group webpage: <http://home.iitj.ac.in/~santosh/>

Work: Multiscale Modeling, Soft Matter Physics, Materials Science, Statistical Physics, Polymer Physics.

Dr. Prabhat K. Jaiswal

Associate Professor

Department of Physics

Indian Institute of Technology Jodhpur

Contact No. - +91 (0) 291 280 1612

Email – prabhat.jaiswal@iitj.ac.in

Google Scholar Profile: <https://scholar.google.de/citations?user=tWkYvGQAAAAJ&hl=en>

Group webpage: <https://sites.google.com/site/prabhatjaiswal/>

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Work: Phase-separation kinetics, Wetting at Surfaces, Patterns and Instabilities in Thin Films, Effect of Disorder in Unstable Systems, Confined Systems in the presence of Gradients, Mechanical Properties of Glasses and Granular Media, Self-Assembly of Patchy Particles.