

Jayashree Narayan

[Website](#) [Email](#) [Github](#)

EDUCATION

- **Freie Universität Berlin** Berlin, Germany
Incoming PhD candidate
Funded by the [Marie Skłodowska-Curie Actions](#) Doctoral Network, [Track the Twin](#).
Guide: [Prof. Cecilia Clementi](#) Sept 2025 – Ongoing
- **Indian Institute Of Science Education and Research Mohali** Punjab, India
Bachelors and Masters in Physics done together in 5 years
GPA: 8.9/10 2020 – 2025

PUBLICATIONS

Mass-Zero constrained molecular dynamics for electrostatic interactions | Submitted, JCP (May 2025)

The Master's thesis work done under the guidance of Prof. Sara Bonella has been submitted to JCP, with me as the third author. [ArXiv](#)

Turbulence inference from Synthetic Observations | Submitted, MNRAS (May 2025)

The Summer Internship work done under the guidance of Prof. Christoph Federrath has the potential to be published. We have submitted the manuscript to MNRAS with me as the first author.

Can Close-In Exoplanets form by Pebble Accretion?

Jayashree Narayan, Joanna Drażkowska, Vignesh Vaikundaraman, Monthly Notices of the Royal Astronomical Society, Volume 540, Issue 1, June 2025, Pages 165174, [URL](#)

INTERNSHIPS

Computing Electrostatic Forces in MD | Master's Thesis Project

École polytechnique fédérale de Lausanne / NCCR-MARVEL Inspire Scholarship

Lausanne, Switzerland

Aug 24 – Apr 25

- Guide: [Prof. Sara Bonella](#)
- Worked with Prof. Sara and her team to optimize (using MPI and OpenMP) a recently developed constrained extended Lagrangian approach for computing electrostatic forces.
- We have obtained a 97% speedup of the code through this optimization.

Turbulence Inference from Synthetic Observations

The Australian National University / FRT Scholarship

Canberra, Australia

May 24 – Aug 24

- Guide: [Prof. Christoph Federrath](#)
- In his [paper](#) about measuring turbulence, his team performed calculations on turbulent clouds in the optically thin medium. My project is an extension of his work, but in the optically thick medium.
- The results show the expected differences between the optically thick and thin media.

Planet Formation through Pebble Accretion

Max Planck Institute for Solar System Research / DAAD Scholarship

Göttingen, Germany

May 23 – Aug 23

- Guide: [Dr Joanna Drażkowska](#)
- Using her [pebble predictor](#), and the analytical fits to numerical simulations from [Ormel & Liu \(2018\)](#) and [Liu & Ormel \(2018\)](#), I studied the influence of disk turbulence, pebble fragmentation and stellar metallicity on planet growth by pebble accretion.
- The results fortify the theory that the likelihood of planet formation (for close-in planets) is high when there is high pebble fragmentation, low disk turbulence, or even a very metallic star.

Metropolis Monte Carlo Algorithm

IISER Mohali

Punjab, India

Jun 22 – Jul 22

- Guide: [Prof. Anosh Joseph](#)
- Studied the concepts in different Monte Carlo Simulation techniques, designed and implemented in C++, Python programs.

AWARDS AND CERTIFICATES

- **MSCA Doctoral Fellowship Awardee** 2025 – 2028
My Doctoral degree is funded by the [Marie Skłodowska-Curie Actions](#) Doctoral Network [Track the Twin](#).
- **MARVEL Scholar** 2024 – 2025
I was a recipient of the [INSPIRE Potentials MARVEL Master's Fellowships](#). It is a 6-month fellowship for a Master's thesis project for women in the field of nanomaterial science at EPFL. It is granted to 8 women per year
- **FRT Scholar** 2024
I was a recipient of the [FRT scholarship](#) for the summer of 2024.
- **DAAD Scholar** 2023
I was a recipient of the DAAD-WISE scholarship for the summer of 2023.
- **From Quantum Matter to Quantum Computers: Masters School** 2022
I was selected for a 4 day virtual masters school organized by the Max Planck Institute for the Physics of Complex Systems between October 4th 2022 and October 6th 2022
- **Mimamsa, Zonal Topper Award** 2021
My Team won the Zonal Topper award for the states of Punjab and Haryana in the Mimamsa online written test encompassing questions from biology, physics, maths and chemistry.

EXTRACURRICULAR ACTIVITIES

- **Supernova Foundation Mentor** 2025
Since 2023, I was a mentee at the [Supernova Foundation](#). Once I became a graduate student, I signed up as a mentor!
- **Chief Editor of Manthan IISER Mohali** 2023
As Chief editor, I managed a team of over 65 members at [Manthan magazine](#). So far, we have published 2 magazine editions and 3 newspaper editions.
- **Website Developer, DAE-HEP 2022** 2022
A partner and I developed the website from scratch for the [DAE-HEP Symposium 2022](#).
- **Active Member - Turing IISER Mohali** 2022
As an active member, I helped organize events like [Code Golf](#) (a coding competition), developed a [video game](#), and I also managed the club's Twitter account.
- **Convener - WiPMA IISER Mohali** 2022
As a convener, I was part of the group that organized talks and interactive sessions between female students interested in Physics, Mathematics and Astronomy.

COMPUTATIONAL SKILLS

- Skills: Deep Learning, Bash scripting, MPI parallelization, OpenMP parallelization, Starmaps parallelization, Code optimization, Monte Carlo Algorithm, Extensive HPC usage
- Languages: Python, C, C++, HTML, CSS, Julia

REFERENCES

Dr Joanna Drażkowska
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✉ [Email](#)

Prof. Christoph Federrath
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