Parth Pavaskar

PhD Candidate
DESY Zeuthen & University of Potsdam

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2.112, Institute of Physics and Astronomy, University of Potsdam,
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Education

Ph.D in Theoretical Astroparticle Physics — **09.2021 – Present**
Deutsches Elektronen-Synchrotron & Universität Potsdam — *Expected Completion – 08.2025*

Thesis (tentative)*: Compressibility in magneto-hydrodynamic turbulence*
Supervisors*: Prof. Dr. Huirong Yan, Prof. Dr. Tim Dietrich*

Master of Science in Astro & Particle Physics — **10.2018 – 01.2021**
Eberhard Karls Universität Tübingen — *Final Grade – 1.3*

Thesis*: UV Spectral Analysis of K648, the Central Star of Planetary Nebula Ps1 in the Globular Cluster M15*
Supervisors*: Prof. Dr. Klaus Werner, Dr. Thomas Rauch*

Bachelor of Science in Physics — **08.2015 – 04.2018**
Savitribai Phule Pune University — *Grade – First Class w/ Distinction*

Major*: Physics (Astronomy & Astrophysics, Lasers & Optics)*
Minor*: Mathematics, Statistics*

Academic Training

Erlangen Astroparticle School — **10.2022**
Erlangen Centre for Astroparticle Physics (ECAP), Erlangen, Germany

- Graduate school focusing on Astroparticle and Gamma-ray physics.

Fundamentals of Particle-In-Cell Simulations — **08.2021 – 11.2021**
Particle In Cell Consulting LLC (online)

- Programming course on the particle-in-cell method for Plasma Simulations.

Visiting Research Student — **04.2021 – 08.2021**
Deutsches Elektronen-Synchrotron (DESY), Zeuthen, Germany

- Visiting reseacrh student position in collaboration with the Astroparticle Theory group (THAT) at DESY Zeuthen.

FORTRAN for Scientific Computing — **12.2019**
High-Performance Computing Center Stuttgart (HLRS), Stuttgart, Germany (online)

- Programming course for scientific applications with Fortran.

Skills

Programming Languages Julia, Python, FORTRAN, C, C++, MATLAB, C#, VHDL, R

Softwares and Technical 4 years of experience in Astrophysical Plasma simulations and High Performance Computing (HPC). Experience in implementing MPI parallelization, Adaptive Mesh Refinement (AMR), Adaptive Time-stepping (ATS) and large data handling.

- **Athena++** for isothermal ideal MHD and kinetic-MHD hybrid simulations
- **Pluto**, **ZeusMP** for compressible MHD
- **PENCIL** for incompressible MHD
- **Gkeyll**, **iPIC3D**, **Smilei** for particle-in-cell (PIC) simulations
- **CRpropa3** for cosmic ray test particle simulations and diffusion modelling.
- **TMAP** for NLTE radiative transfer modelling of stellar atmospheres.

Languages English (fluent), Hindi (fluent), Marathi (native)
German (basic), Sanskrit (basic)

Teaching Experience

Thesis mentoring of Mr. Percy Martinez (M.Sc Astrophysics, Uni. Potsdam) **10.2024 – present**
Master thesis titled "Damping of kinetic Fast mode MHD waves in turbulent particle-in-cell simulations".

Tutoring for M.Sc Astrophysics (University of Potsdam) **Winter semester 2023-24**
Tutoring for the course "Physical Processes in Astrophysics".

Mentoring of Mr. Maksym Riabokon (DESY Ukraine Winter School 2023) **01.2023 – 03.2023**
Intern project titled "Cosmic-ray diffusion in decomposed linear modes of MHD turbulence".

Mentoring of Mr. Ninad Khobrekar (DESY Summer Intern 2022) **07.2022 – 09.2022**
Intern project titled "Dependence of MHD mode energy fractions on the driving mechanism of turbulence in MHD simulations".

Publications

Diagnostics of magnetohydrodynamic modes in the ISM through synchrotron polarization statistics **ApJ 971 58** **2024**
Parth Pavaskar, *Ka Ho Yuen, Huirong Yan, Sunil Malik*

Magnetic field measurement from the Davis–Chandrasekhar–Fermi method employed with atomic alignment **MNRAS 523 1 1056–1066** **2023**
Parth Pavaskar, *Huirong Yan, Jungyeon Cho*

Talks

ASTRONUM 2024, La Rochelle, France **01.07.2024**
Diagnostics of magnetohydrodynamic modes in the ISM through synchrotron polarization statistics

Midwest Magnetic Fields Workshop 2024, Madison, Wisconsin, USA (online) **08.06.2024**
Diagnostics of magnetohydrodynamic modes in the ISM through synchrotron polarization statistics

Midwest Magnetic Fields Workshop 2023, Madison, Wisconsin, USA (online) **26.05.2023**
Davis Chandrasekhar Fermi method using Ground State Alignment

IMAGINE Consortium meet 2023, Stockholm, Sweden **06.04.2023**
DCF method using atomic polarization from Ground-state Alignment

Astroparticle School 2022, Obertrubach-Bärnfels, Germany **07.10.2022**
Davis-Chandrasekhar-Fermi method employed with Ground-state Alignment