

Hitesh Kishore Das

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Education

PhD in Astrophysics (Ongoing)

International Max Planck Research School on Astrophysics (IMPRS)
Max Planck Institute for Astrophysics (MPA), Garching, Germany
Ludwig Maximilians University (LMU), Munich, Germany
Duration: 2021-Present

Master of Science

Indian Institute of Science (IISc), Bengaluru, India
Major: Physics
Duration: 2020-2021

Bachelor of Science (Research) Indian Institute of Science (IISc), Bengaluru, India

Major: Physics
Duration: 2016-2020

Research Experience

PhD Thesis: The dynamics of magnetized, multiphase gas in a turbulent environment

[8 SEP 2021 - PRESENT]

We are studying the different aspects of multiphase gas, like survival, morphology and growth, in a turbulent medium in presence of magnetic fields. We use idealised MHD simulations run using Athena ++ for this study.

Doctoral Advisor: Dr. Max Gronke
Formal supervisor: Prof. Volker Springel
Collaborators: Dr. Rainer Weinberger
Max Planck Institute for Astrophysics, Garching

Role of temperature and metallicity in the evolution of thermal instability

[1 AUG 2019 - PRESENT]

This project contributed towards my Bachelors thesis and led to a research paper in collaboration with Dr. Prakriti Pal Choudhury and Prof. Prateek Sharma.

Under supervision of: Assoc. Prof. Prateek Sharma
Collaborator: Dr. Prakriti Pal Choudhury Physical Sciences, Indian Institute of Science, Bangalore

Computational Studies of Systems of Self-driven Particles

[8 MAY 2019 – 12 JUL 2019]

This project aimed at investigating the underlying physical origin of this “phase transition” via the development of appropriate computational models.

Under supervision of: Assoc. Prof. Massimo Pica Ciamarra
School of Physical & Mathematical Sciences, Nanyang Technological University, Singapore →

Publications

- Magnetic Fields in Multiphase Turbulence: Impacts on Dynamics and Structure

Hitesh Kishore Das, Max Gronke Monthly Notices of the Royal Astronomical Society, Volume 527, Issue 1, January 2024, Pages 991–1013, doi.org/10.1093/mnras/stad3125
arXiv: [2307.06411](https://arxiv.org/abs/2307.06411)

- Shatter or not: role of temperature and metallicity in the evolution of thermal instability

Hitesh Kishore Das, Prakriti Pal Choudhury, Prateek Sharma
Journal: Monthly Notices of the Royal Astronomical Society, Volume 502, Issue 4, April 2021, Pages 4935–4952, doi.org/10.1093/mnras/stab382
arXiv: [2009.11317](https://arxiv.org/abs/2009.11317)

Conferences and Seminars

- **Annual Astronomical Society of India (ASI) meeting 2024** (Jan 30-Feb 4, 2024). Presented a **poster** at IISc, Bangalore, India.
- **2023 IAP colloquium: New simulations for new problems in galaxy formation** (December 11-15, 2023). Gave a **talk** in-person at IAP, Paris, France.
- **MIST2023 : Cosmic turbulence and Magnetic fields** (September 24 - October 1, 2023) Gave a **talk** in-person at Cargese, Corsica, France.
- **Modelling of Multiphase Astrophysical Media** (May 30-June 2, 2023) Presented a ~15 min talk about my work. In-person at Aspenstein Castle, near Lake Kochel, Germany
- **MPA weekly Institute Seminar** (May 15, 2023) Presented a ~45 min talk about my work. In-person at MPA, Garching, Germany
- **52nd Saas-Fee winter School on “The Circum-Galactic Medium across cosmic time: an observational and modelling challenge”** (March 19-24, 2023) Presented a poster about my work. In-person at Les Diablerets, Switzerland
- **Team meeting for “Observe Local Think Global: What Solar Observations can teach us about Multiphase Plasmas across Astrophysical Scales”** (March 13-17, 2023) Presented an introduction for simulations in ICM/CGM, and my work. In-person at ISSI, Bern, Switzerland
- **The Multiphase Circumgalactic Medium** (February 26- March 3, 2023) Presented a ~15 min talk about my work. In-person at Ringberg Castle, Germany
- **Lyman-X Day: ORIGINS workshop** (October 5, 2022) Attended in-person at European Southern Observatory (ESO), Garching
- **The National Astronomy Meeting (NAM) 2022** (July 11-15, 2022) Attended virtually and submitted a poster for the parallel session “Non-equilibrium thermodynamics across scales: from the solar corona to the intracluster medium”.
- **Gas Flows around Galaxies: ORIGINS workshop** (May 24, 2022) Presented my work in-person at MPA, Garching