# Swati Gavas

## Personal Data

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| Place and Date of Birth: | Kolhapur, Maharashtra, India \| July 1994 |
| Nationality and Gender: | Indian \| Female |
| Webpage: | swati-gavas.github.io/profile/ |

## Post-Doctoral Positions

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| Tenure: | APR 2025 - Present |
| Advisor/Host: | Dr. Nishikanta Khandai |
| Institute: | National Institute of Science Education and Research (NISER), Bhubaneswar |

## PhD

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| Tenure: | AUG 2018 - DEC 2024 |
| Topic: | Aspects of gravitational clustering and structure formation in the Universe |
| Advisor: | Prof. Jasjeet Singh Bagla |
| Institute : | Indian Institute of Science Education and Research (IISER), Mohali |

## Education

July 2017 — Master of Science in Physics,
**Department of Physics, Savitribai Phule Pune University**, Pune
Major: Astronomy and Astrophysics | Cgpa: 8.27/10

July 2015 — Bachelor of Science in Physics
DBJ College, Chiplun, **Mumbai University** | Cgpa: 7/7
Secured third rank at the University level

## Research Interest

- Gravitational clustering and large-scale structure formation through cosmological simulations and analytical modeling, linking theory with survey observations.
- Dark matter halos, galaxy formation, and baryonic processes
- Thermodynamics of late-time cosmology

## Publications NASA-ADS

2022 : Swati Gavas, Jasjeet Bagla, Nishikanta Khandai, Girish Kulkarni
Halo mass function in scale invariant models,
MNRAS, Volume 521, Issue 4, June 2023, Pages 5960–5971

2024 : Swati Gavas, Jasjeet Bagla, Nishikanta Khandai
Dispersion in the Hubble-Lemaître constant measurements from gravitational clustering,
Phys. Rev. D 111, 043516 – 10 February, 2025

Jasjeet Bagla, Swati Gavas
On the origin of transient features in cosmological N-Body Simulations,
JOAA, Volume 46, article number 33, 16 June 2025

2025 : [Submitted]
Dipayan Mukherjee, Harkirat Singh Sahota, Swati Gavas
A dynamical systems perspective on the thermodynamics of late-time cosmology
gr-qc, astro-ph.CO

[In preparation]
Ayan Nanda, Nishikanta Khandai, Jasjeet Singh Bagla, Swati Gavas
Self-Similarity of Halo Shapes in Cosmological Simulations.

[In preparation]
Swati Gavas, Ayan Nanda, Nishikanta Khandai
Finite box size effect on halos scales

## CONFERENCES, SCHOOLS AND WORKSHOPS

29-2 Oct 2025: (presented talk)
**Challenges and Innovations in Computational Astrophysics VI**
Held at Indian Institute of Science Education and Research (IISER), Mohali
Talk title: Numerical Artifacts of Restricted Power Spectrum in cosmological N-Body Simulations

11 Nov 2024: (presented talk)
**Computational and Observational Cosmology Group at the Observatório Nacional - ON(RJ/Brazil)**
Talk title: Dispersion in the Hubble-Lemaître constant measurements from gravitational clustering

14-25 Oct 2024: **3rd IAGRG School on Gravitation and Cosmology**
Held at International Centre for Theoretical Sciences (ICTS), Bengaluru, India

1-2 July 2024: (presented talk)
**Séminaire Univers Institut d'Astrophysique de Paris (IAP)**
Visit to Prof. Stephane Colombi at Institut d'Astrophysique de Paris (IAP), France
Talk title: Halo mass function in scale-invariant models

17-28 June 2024: (presented talk)
**Summer School on Cosmology**
Held at International Centre for Theoretical Physics (ICTP), Trieste, Italy
Talk title: Dispersion in the Hubble-Lemaître constant measurements from gravitational clustering

1-4 Feb 2024: (presented talk)
**42nd Meeting of Astronomical Society of India**
Held at IISc, ISRO and JNP Bengaluru, India
Talk title: Dispersion in the Hubble-Lemaître constant measurements from gravitational clustering

6-9 Dec 2023: (presented talk)
**10th International Conference on Gravitation and Cosmology**
Held at IIT Guwahati, India
Talk title: A Local Perspective on Hubble Tension from Cosmological N-body Simulations

7-9 Nov 2023: (presented talk)
**Challenges and Innovations in Computational Astrophysics V**
Virtual Meeting
Talk title: A Local Perspective on Hubble Tension from Cosmological N-body Simulations

24-28 Oct 2022: (presented talk)
**The 10th KIAS Workshop on Cosmology and Structure Formation**
Held at KIAS, South Korea
Talk title : Halo mass function in scale invariant models

2-6 Nov 2020: (presented poster talk)
**The 9th KIAS Workshop on Cosmology and Structure Formation**
Held at KIAS, South Korea
Poster title : Fractal dimension: Scale of homogeneity

13-17 Feb 2020: (presented poster)
**38th Meeting of Astronomical Society of India**
Held at IISER Tirupati, India
Poster title : Non-universality of halo mass function using power law model

13 Feb 2020: **Morphology of Galaxies from Classical Techniques to Deep Learning**
One day workshop held at IISER Tirupati, India under ASI 2020

27-31 Jan 2020: **School on Observing The First Billion Years of the Universe Using Next Generation Telescopes**
Five days school held at IIT Indore, India

10-13 Dec 2019: (presented poster and volunteered)
**9th International Conference on Gravitation and Cosmology**
Held at IISER Mohali, India
Poster title : Non-universality of halo mass function using power law model

## Fellowships, Scholarships & Awards

ANRF-ITS 2024: International travel grant to attend school in Italy
INSA-INYAS SciArt 2021: International SciArt Image Competition 2021
Third prize in simulation category for first entry
Certificate of appreciation for second entry
UGC-SET 2018: For lectureship in physics
INSPIRE Fellowship 2017: Fellowship for Doctorate program in physics
GATE physics 2018: All India Rank- 484
JAM physics 2015: All India Rank- 460
INSPIRE SHE: INSPIRE Scholarship for Higher Education
Tenure: 2012-2017

## Other Research Experience

Jan-May 2017 **Masters project at IUCAA, Pune, India**
*N-body simulations to study large scale structure of the universe and study halo properties.*
Supervisor : Dr. Aseem Paranjape, IUCAA, Pune, India.

JUN-JULY 2016 **Summer School Project at IPR, Gandhinagar, India.**
*Time dependent electron-ion collision frequency in a strong laser field using non-Maxwellian electron velocity distribution function*
Supervisor : Dr. Mrityunjay Kundu, IPR, Gandhinagar, India.

## Teaching & Mentoring

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| Jan-present 2025: | Co-mentoring a PhD student as a part of collaboration |
| Aug-Dec 2022: | PHY111 Physics lab Mechanics (IISER Mohali) |
| Jan-May 2021: | IDC201 Introduction to astronomy (IISER Mohali) |
| Jan-May 2020: | PHY212 Modern Physics Lab (IISER Mohali) |
| Aug-Dec 2019: | PHY411 Nuclear Physics Lab (IISER Mohali) |

## Technical Skills

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| High Performance Computing : | Kalinga(NISER), astro (NISER), HPC-IISERM |
| Programming Languages : | Python, Julia, Fortran90, C/ C++. |
| Operating Systems : | Linux based systems |
| Typesetting software : | LaTeX |

## Languages

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| Mother tongue: | Marathi |
| Fluent: | English, Hindi |

## OTHERS

- May 2017: Video on 'zero shadow day' shown in outrageous acts of sciences (UK) / you have been warned (USA), a Discovery channel show.
- jan 2011: **INSPIRE Internship**
  Won first prize in the 'Innovation in Mechanics' competition during the internship.
- Dec 2009: **National Means Cum-Merit Scholarship Scheme (NMMSS)**
  Tenure: 2009-2012