

Himanshu Abhay Bhisikar

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H.A. Bhisikar

Education

Aug 2016 - May 2022	BS-MS DUAL DEGREE INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, PUNE Specialization : Physics, MS CGPA - 7.6/10.0 MS Thesis : A Study of Clumps and Star formation in NGC 4571	Pune, MH, India
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Positions and Appointments

Aug 2024 - Present	DST-SERB Project Associate INDIAN INSTITUTE OF ASTROPHYSICS, BENGALURU Collaborator : Dr. Smitha Subramanian	Bengaluru, KA, India
Feb 2024 - Jun 2024	Research Intern INDIAN INSTITUTE OF TECHNOLOGY, INDORE Collaborator : Dr. Priyanka Singh	Indore, MP, India
Aug 2022 - Dec 2023	VSP Research Intern INDIAN INSTITUTE OF ASTROPHYSICS, BENGALURU Collaborator : Dr. Smitha Subramanian	Bengaluru, KA, India
Mar 2021 - May 2022	Master's Thesis Fellow INTER-UNIVERSITY CENTER FOR ASTRONOMY AND ASTROPHYSICS, PUNE Collaborators : Prof. Kanak Saha, Dr. Chayan Mondal	Pune, MH, India

Publications

- [2] **H.A. Bhisikar**; Kanak Saha; Chayan Mondal "Deciphering the young star-forming regions in NGC 4571: A UVIT-DECaLS-ALMA study" (IN PREPARATION)
- [1] **H.A. Bhisikar**; Smitha Subramanian; Luis. C Ho; S Ramya "A search for relic galaxies in the local universe" (AJ, IN REVIEW)

Conference presentations and talks

May 2026	44th meeting of the Astronomical Society of India (Poster) "Disentangling Merger-Driven and Secular Starburst Activity in Dwarf Galaxies"	Guwahati, AS, India
Jan 2024	42nd meeting of the Astronomical Society of India (Poster) "The search for massive relic galaxies in the local universe"	Bengaluru, KA, India
Jan 2024	Star formation studies in India (Poster) "Deciphering the young star-forming regions in NGC 4571: A UVIT-SDSS-ALMA study"	Kolkata, WB, India
Jan 2024	41st meeting of the Astronomical Society of India (Poster) "Deciphering the young star-forming regions in NGC 4571: A UVIT-SDSS-ALMA study"	Indore, MP, India

Grants and fellowships

Aug 2024 - Oct 2025	DST-SERB Grant INDIAN INSTITUTE OF ASTROPHYSICS, BENGALURU Supported by a research scholarship through the DST-SERB grant SPG/2021/002672	Bengaluru, KA, India \$5000 ₹4,40,000
Aug 2022 - May 2023	Visiting Student Program INDIAN INSTITUTE OF ASTROPHYSICS, BENGALURU Supported by a Research studentship through the Visiting Student Programme (VSP)	Bengaluru, KA, India \$1000 ₹90,000

Observing proposals

2024	Co-I (86.4 ks) Title : <i>Probing the star forming properties of dwarf galaxies in Lynx-Cancer void using Hα</i>	Faint Object Spectrograph & Camera , 3.6m Devasthal Optical Telescope
2024	Co-I (64.8 ks) Title : <i>Probing the star forming properties of dwarf galaxies in Lynx-Cancer void using Hα</i>	Himalaya Faint Object Spectrograph, 2m Himalayan Chandra Telescope
2023	Co-I (160 ks) Title : <i>FUV view of star formation in the discs of local analogs of high-redshift red nuggets</i>	Ultra Violet Imaging Telescope, Astrosat

Research Experience

Aug 2024 - Present

DST-SERB Project Associate - I

IIA-Bengaluru

Enhancement in star formation activity in massive post-merger galaxies

- Studying the radial distribution of star formation activity in massive post-merger galaxies using GALEX FUV imaging data.
- Quantified the star formation enhancement beyond the optical radius (R_{25}) by comparing with non-interacting systems.

Effect of interactions in the evolution of low mass galaxies

- Conducting a SDSS-MaNGA study of 74 (8 post-merger + 66 non-interacting) dwarf galaxies involving the study of 2D spatially resolved maps of galaxy properties such as stellar and gas kinematics, ionized gas emission, and star formation
- Looking for subtle signatures of interaction, such as disturbed velocity fields, asymmetric or clumpy star formation, and misalignments between stellar and gas kinematics.

Anomaly detection in astronomical imaging data

- Developed a pre-trained deep CNN feature extractor pipeline using pytorch to identify images with imaging irregularities such as background gradients, diffraction spikes, overlaps with neighbors, and monocolour streaks in SDSS 3-color composite images.
- Applied principal component analysis for dimensionality reduction, along with gaussian mixing to classify images beyond the specified threshold as anomalous.

Feb 2024 - June 2024

Research Intern

IIT-Indore

Environment of post-starbursts

- Developed a complete end-to-end workflow to perform multi-wavelength photometric data extraction and SED modeling using FAST++ and incorporating redshifts estimated by EAZY.
- Contributed to the analysis of cosmological simulations from CAMELS and Illustris-TNG.

Aug 2022 - June 2023

Visiting Research Intern

IIA-Bengaluru

A search for relic galaxies in the local Universe

- Conducted a comprehensive census of local relic galaxies using structural and stellar population data from SDSS optical imaging and spectroscopic data.
- Developed custom Python pipelines for data cleaning, feature extraction, and catalog generation of high-confidence relic galaxy candidates.

ML classification of Compact Massive and Normal Elliptical Galaxies

- Developed an end-to-end ML pipeline using Astropy and scikit-learn to classify compact massive and normal elliptical galaxies from structural parameters.
- Employed Fisher scores for feature selection, trained Logistic Regression model achieving $\sim 98\%$ accuracy, quantified morphological drivers of compactness using feature importance.

Nov 2022 - Dec 2022

Workshop attendee

IUCAA-Pune

Study of a Lyman continuum leaker candidate at $z \sim 1$

- Derived the properties of a Lyman-Continuum (LyC) leaking galaxy at $z \sim 1$ through SED-modeling of multi-wavelength UV-Optical-IR photometric data using CIGALE.
- Complemented it with a spectroscopic study using HST grism and MUSE IFU data to derive galaxy properties and determine the escape fraction of LyC-escaping photons.

May 2021 - July 2022

Master's Thesis fellow

IUCAA-Pune

Deciphering the young star-forming regions in NGC 4571

- Investigated the connection between star-forming activity and molecular gas distribution in NGC 4571 using multi-wavelength UV, optical, and sub-mm data.
- Performed source detection and aperture photometry to identify star-forming clumps and giant molecular clouds, analyzing their spatial associations to reveal galaxy-wide trends.

Schools, Symposiums, Workshops

Jan 2025	AI/ML applications in Astronomy and Astrophysics (virtual)	IUCAA, Pune
Apr 2024	Raising Veil on Star Formation 2024 (virtual)	KICC, Cambridge
Aug 2023	Space science and Technology AwaReness Training (virtual)	ISRO-IIRS, Dehradun
Jan 2023	3rd Indo-French CEFIPRA Astronomy Meeting (IFCAM)	IIA, Bengaluru
Nov 2022	7th Indo-French Astronomy School (IFAS7)	IUCAA, Pune
Sep 2022	Modern Engineering Trends in Astronomy (META)	IIA, Bengaluru
Sep 2022	Celebrating 7 years of Astrosat	ISRO, Bengaluru
Jul 2022	Gaia Symposium: DR3 and beyond	IIA, Bengaluru
Jun 2022	Intro2Astro (virtual)	Caltech, Pasadena
Aug 2021	Connecting Science Communication with Cognition (virtual)	NIAS-IISc, Bengaluru
Jun 2021	Code/Astro (virtual)	Caltech, Pasadena
Dec 2019	ACM Winter School of Geometric Algorithms	IISER, Pune

Software and tools

- Source detection, Aperture and PSF photometry using [SExtractor](#), [IRAF](#), and [photutils](#)
- Morphological modeling of galaxy structure using [GALFIT](#), [Imfit](#), and [GalSim](#)
- Spectral analysis of SDSS (BOSS, eBOSS, APOGEE-1,2) galaxy spectra using [firefly](#)
- Multi-wavelength Spectral energy distribution (SED) modeling using [FAST++](#), [EAZY](#) and [CIGALE](#)
- SDSS-MaNGA data retrieval and analysis using [Marvin](#)
- Handling and querying large astronomical catalogs and archives using [astroquery](#) and [Astropy](#)
- Statistical modeling, signal/image processing, fourier transforms, and hypothesis testing using [SciPy](#)
- Supervised and unsupervised machine learning (classification, regression, clustering) using [scikit-learn](#)
- Deep learning and neural network development using [TensorFlow](#) and [PyTorch](#)
- Parallelized execution of python pipelines on HPC environments using [SLURM](#)

Computer and other skills

Advanced	python, T _E X (L ^A T _E X, B _I B T _E X), Git and Github, anaconda, Linux
Intermediate	C/C++, fortran, markdown, SQL, ADQL, bash, Office suites
Basic	R, Rmarkdown, YAML, reStructuredText, MATLAB
Languages	English, Hindi, Marathi (Native language), Tamil, Odia, Kannada

Leadership

Secretary | Dining Committee, IISER-Pune

2021 - 2022

Oversaw inspections for the campus catering messes during the COVID-19 pandemic. Ensured compliance with hygiene and safety standards while maintaining uninterrupted operations. Implemented budgetary reforms amid supply-chain and staffing challenges.

Joint Secretary | Career Development and Placement Committee, IISER-Pune

2021 - 2022

Organized workshops, mentorship sessions, and placement initiatives, fostering interpersonal growth by organizing 30+ community events in career planning, skill development, and internship/job opportunities.

Academic mentor, IISER-Pune

2020 - 2022

Guided and supported junior students from underprivileged backgrounds, providing academic assistance, mentorship, and career guidance to help them in their coursework and research opportunities.

Head coordinator | MIMAMSA Invigilation team, IISER-Kolkata

2019

Supervised over 100 teams as one of only two invigilators at IISER-Kolkata, ensuring smooth conduct of India's largest university-level science quiz in coordination with the central organizing team.

Head Coordinator | MIMAMSA Hospitality team, IISER-Pune

2018

Led the hospitality team during India's largest university-level science quiz, overseeing logistics, catering, and accommodation for participants to ensure smooth and efficient event operations.

References

Smith Subramanian, IIA-Bengaluru

DST-SERB supervisor, smitha.subramanian@iiap.res.in

Kanak Saha, IUCAA-Pune

Masters Thesis Advisor, kanak@iucaa.in