

Aniket Nath

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Education

2020 - 2025 **National Institute of Science Education and Research Bhubaneswar**,
Integrated Masters in Physical Sciences(major), Computer Sciences(minor), Affiliated to HBNI,
CGPA - 8.65/10.

Research Experience

- LTVSP **Investigating polarisation signatures in Black holes**,
Supervisor: Dr. Pallavi Bhat, ICTS-TIFR.
○ This project is under Long Term Visiting Students program of ICTS.
○ Studying the effect of gas physics on electromagnetic observables from black holes.
○ Using relevant general relativistic magnetohydrodynamic simulations from BHAC and HARM.
○ The work is in progress.
- Master's Thesis **Constraining Galactic Magnetic Field properties from Radio observations**,
Supervisor: Dr. Tuhin Ghosh, NISER Bhubaneswar.
○ This is in continuation with the Summer 2023 work.
○ Simulated Synchrotron maps using best fitted parameters with respect to WMAP data.
○ Studying the statistics of these fields using Power spectrum, Minkowski Functionals.
○ Looking into the specific scales of interest.
○ The work is in progress.
- Summer 2024 **Construction of Dark Matter Halo Merger Trees**,
Supervisor: Dr. Sambit Giri, Nordic Institute of Theoretical Physics, NORDITA.
○ The aim of this project was to study dark matter halo merger trees for different cosmologies.
○ GALFORM algorithm, based on Extended Press Schechter Theory was used to construct merger trees.
○ Merger trees were constructed for different cosmological parameters, and their variation was observed.
- Summer 2023 **Correlating properties of Galactic Magnetic Field and Galactic Synchrotron**,
Supervisor: Dr. Pravabati Chingangbam & Dr. Tuhin Ghosh , IIA Bengaluru, NISER Bhubaneswar.
○ The aim of this project was to study Galactic Magnetic Field (GMF), using two-point correlation function and higher statistics.
○ Synchrotron maps have been simulated using models and different input parameters using the *gpempy* module.
○ Statistics were evaluated for these maps, and the properties were being studied using the statistics.
○ Tried to match the statistics with data, by exploring the parameter space.
- Summer 2022 **Analysing X-ray spectra of Dual AGNs**,
Supervisor: Dr. Mousumi Das & Dr. Santanu Mondal, IIA Bengaluru.
○ The project aimed at analysing x-ray spectral signatures from dual AGNs.
○ Observed Fe K α spectral signature in a binary system, previously unreported.
○ This work has been accepted in *Astronomy & Astrophysics*, the manuscript can be found [here](#)

Publications

- 2024 **Detection of the Fe K lines from the binary AGN in 4C+37.11**,
Santanu Mondal, Mousumi Das, K. Rubinur, Karishma Bansal, Aniket Nath, Greg B. Taylor, [arxiv][A&A].

Achievements

- 2024 **NORDITA Summer Intern, Nordic Institute of Theoretical Physics(NORDITA)** , *Intern.*
2023 **SERB MATRICS Fellow (Science and Engineering Research Board, Govt. of India)**, *Fellowship.*
2022 **Summer Research Fellow (IASc, INSA, NASI)**, *Fellowship.*

2020 **DISHA (DAE Incentive Scheme for Holistic Science Education and Augmentation) Scholarship, Govt. of India, Scholarship.**

Schools, Workshops, Conferences

October 2025 **Future of Gravitational Wave Astronomy, ICTS-TIFR.**

- Hosted by ICTS-TIFR.
- Attended as a participant.

Summer 2024 **COBRA: Conference on Blazars and Restless AGNs, Presidency University, IUCAA.**

- Hosted by Presidency University, in collaboration with IUCAA.
- Attended as a participant in Workshop and the Conference.

Monsoon **Physics of Life Monsoon School, NCBS-TIFR.**

- 2024
- Hosted by National Centre for Biological Sciences, Tata Institute for Fundamental Research, at Bengaluru.
 - Attended as a participant, and had the opportunity to explore some domains of biophysics.

Winter 2023 **Advanced 21 cm Cosmology Winter School, NISER Bhubaneswar.**

- Hosted by NISER Bhubaneswar as a part of the SKA-India Collaboration.

Winter 2022 **Radio Astronomy Winter School, IUCAA, NCRA.**

- Jointly hosted by Inter-University Centre for Astronomy and Astrophysics (IUCAA) and National Centre for Radio Astronomy - Tata Institute of Fundamental Research (NCRA-TIFR),

Teaching Experience

Teaching CS460/660 Machine Learning 2024
Assistant

Computer Skills

Languages Python, Julia, FORTRAN

Utilities Anaconda, Git, Jupyter Notebook, L^AT_EX

Libraries Healpy, NaMaster(pymaster), Numpy, Astropy ,Pandas, Scipy, Matplotlib

Softwares NASA-HEASOFT, XSPEC, Chandra CIAO

Communication Skills

English Full Professional Proficiency

Hindi Native or Bilingual Proficiency

Bengali Native or Bilingual Proficiency

Relevant Courses

P474 Introduction to Cosmology, Grade:8/10

P452 Computational Physics, Grade:9/10

P457 General Theory of Relativity and Cosmology, Grade:10/10

P464 Plasma Physics and Magnetohydrodynamics, Grade:8/10

P453 Quantum Field Theory-I, Grade:9/10

P463 Astronomy and Astrophysics, Grade:9/10

Talks and Seminars

ICTS-TIFR Astrophysics and Relativity Seminar, *Unveiling the Statistical properties of Galactic synchrotron emission*

Extra Curricular

2021 - **Vaktavya (Debating Club), NISER, Founding Member.**

Current I am a member of the Vaktavya (Debating Club) in NISER. I often participate in various debating competitions, in different formats. I have also participated in a Lok Sabha (Mock Parliament). I am also serving as the President of Vaktavya for the tenure (2024-2025).

2020 - **NISER Astronomy Club, NISER**, *Core-Member, Talks Organizing Committee.*

Current I am a core member of NISER Astronomy Club. I am mainly involved in outreach and organizing of talks, in order to popularize and make astronomy and astrophysics more accessible to people of all levels.

2017 **The Bharat Scouts and Guides, India, Rajya Puraskar Scout.**

I have been a member of the Bharat Scouts and Guides, and I was awarded the Rajya Puraskar in scouting by the Hon'ble Governor of the State of West Bengal.