Vivek Kumar **Jha**

Project Associate

About me

Born: 03 March 1995
Place: Darbhanga, India.
Gender: Male
Nationality: Indian

Current address

Aryabhatta Research Institute of observational sciencES (ARIES)
Manora Peak,
Nainital, Uttarakhand,
India, 263001.

Research Interests

- Active galactic nuclei
- Quasar accretion disks
- Reverberation Mapping
- Supermassive Black Holes
- Computational astrophysics
- Light curve modelling

Other Interests

Classical music, Offbeat travel, Trekking, Reading, Amateur astronomy, Scientific outreach, Writing

Languages

Maithili • Hindi • English

Contact

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Employment

April 2022-present — **Project Associate**
Aryabhatta Research Institute of observational sciencES (ARIES), Nainital, Uttarakhand · India
Involved with the scientific aspects of the upcoming data archive for the ARIES 1.04m ST, 1.3m DFOT and 3.6 DOT.

2020-2021 — **Senior Research Fellow (SRF)**
Aryabhatta Research Institute of observational sciencES (ARIES), Nainital, Uttarakhand · India
Research fellow, pursuing research at this institute leading to the Ph.D degree at DDU Gorakhpur. Thesis title: **Investigating the Nature and Structure of the Inner Regions in Active Galactic Nuclei.**

2018-2020 — **Junior Research Fellow (JRF)**
Aryabhatta Research Institute of observational sciencES (ARIES), Nainital, Uttarakhand · India
Research fellow, pursuing research at this institute leading to the Ph.D degree at DDU Gorakhpur. Thesis title: **Investigating the Nature and Structure of the Inner Regions in Active Galactic Nuclei.**

Education

2022 (expected) — **Doctorate of Philosophy (Ph.D.) in Astrophysics**
Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh · India
Thesis title: **Investigating the Nature and Structure of the Inner Regions in Active Galactic Nuclei.** Supervised by: Dr. Hum Chand and co-supervised by Prof. Shantanu Rastogi. Research centre: ARIES Nainital.

June 2017 — **Master of Science (Physics)**
Banaras Hindu University, Varanasi, Uttar Pradesh · India
Passed with first class and specialization in Space physics.

June 2014 — **Bachelor of Science (Honors in Physics)**
University of Delhi, New Delhi · India
College: Deshbandhu College. Passed with first class.

Academic Awards/Fellowships

- **2018**: Junior Research Fellowship (JRF) from Department of Science and Technology (DST) Government of India.
- **2017**: Selected for Visiting student Internship program at Indian Institute of Astrophysics (IIA).
- **2017**: Qualified Graduate Aptitude in Engineering (GATE): Physics.
- **2017**: Qualified Joint Entrance Screening Test (JEST): Physics. This exam is conducted for admission to Ph.D. in various research institutes in India.
- **2016**: Indian Space Research Organisation (ISRO) sponsored Space Science Promotion Scheme (SSPS) Fellowship for 1 year.

Technical Skills:

Observed extensively using ARIES 1.04m, 1.3m and 3.6m optical telescopes • Used Thai Robotic Telescopes (TRT) remotely • Experience working with multiple archival data sets. Fluent in PYTHON and working knowledge of IDL. • Usage of Git version control. • Data reduction using IRAF and astropy packages including CCDPROC, PHOTUTILS etc. • Usage of LaTeX, HTML and Markdown • OS Used: Linux/ Windows.

Accepted telescope proposals:

- GROWTH India Telescpe (GIT) **Accretion disk reverberation mapping of AGN using the GROWTH telescope GROWTH-ADRM**, cycle 2022-C1 as Co-I
- 1.3m J C Bose Telescope (JCBT). **Photometric Reverberation Mapping of the low luminosity AGNs** , cycle 2022-C1 as Co-I
- 3.6m Devasthal Optical Telescope (DOT). **In search of luminous Quasars at the cosmic dawn**, cycle: 2020-C2, as PI.
- 3.6m Devasthal Optical Telescope (DOT). **Host galaxy imaging of γ ray detected Narrow-line Seyfert 1 (γ NlSy1) galaxies.** cycle 2020-C2, 2021-C1, 2021-C2 as Co-I. PI: Vineet Ojha
- VLT-ESO. **Dissecting baryon cycle in overdense environments**, cycle: P106 as Co-I. PI: Ravi Joshi
- 1.04m Sampoornanand telescope (ST). **Intra-night polarization variability of γ ray detected narrow-line Seyfert 1 galaxies.** cycle 2020 (B) as PI.
- 1.04m Sampoornanand telescope (ST). **Changing look Active Galaxies: Unraveling the AGN host and the role of environment in triggering AGN activity.**, cycle 2020 (B) as PI.
- Thai Robotic Telescope (TRT). **Photometric reverberation mapping of the accretion disk in AGN**, cycles: 8A, 7D and 7C as PI.
- ASTROSAT. **Accretion disk reverberation mapping of MRK 817 using Astrosat**, cycle: A11 as PI.
- 1.3m Devasthal Fast Optical telescope (DFOT). **Photometric Reverberation Mapping of central region of AGN using H-beta emission line**, cycles: 2019 (A), 2019 (B) and 2020 (A), as PI
- 1.04m Sampoornanand telescope (ST). **Multi-wavelength photometric observations of a few Low Red-Shift Broad Line Seyfert 1 Galaxies**, cycles: 2018 (B), 2019 (A) and 2020 (A), as PI

Conferences/meetings/workshops

- **2022** Presented a *talk* titled: **Tools of Optical Photometry** at ARIES Training School in Observational Astronomy, Nainital, India (16-27 May 2022).[link]
- **2022** Presented a *poster* titled: **Accretion disk sizes for Quasars selected from the Zwicky Transient Facility survey** at the 40th meeting of the Astronomical Society of India (ASI) held in Roorkee, India (24-29 March 2022).[link]
- **2022** Presented a *talk* titled: **A look into the heart of Quasars: using light echos as a tool** at Central University of Himachal Pradesh (CUHP), Dharamshala; India on 3rd February. [link]
- **2021** Attended International Summer School on: **The Interstellar Medium of Galaxies, from the Epoch of Reionization to the Milky Way**, held online from July 12-23, 2021. [link]
- **2021** Presented a *poster* titled: **Correlation analysis on a homogeneous sample of NlSy1 and BlSy1 galaxies** at the workshop titled "Multi-object Spectroscopy for Statistical Measures of Galaxy Evolution" held online by Space Telescope Science Institute (STScI), Baltimore; USA (17-20 May, 2021). [link]
- **2020** Attended workshop titled: **Less travelled path of dark matter: Axions and primordial black holes** , held online by ICTS-TIFR; India between November 9-13, 2020. [link]
- **2020** Presented a *talk* titled: **A comparative study of Narrow and Broad line Seyfert galaxies using SDSS** at an international symposium titled "Astronomical Surveys and Big Data 2 (ASBD-2)" held online by the Byurakan Astrophysical Observatory (BAO); Armenia (14-18 September, 2020) [link]
- **2020** Attended **ILMT: International Liquid Mirror Telescope workshop** held online by ARIES, Nainital; India (29 June - 01 July, 2020). [link]
- **2020** Attended one day Indo Thai Workshop titled **Investigating the Stellar Variability and Star Formation** held in ARIES, Nainital; India (02 March 2020). [link]
- **2019** Attended **I-TMT (India- TMT) Science and Instruments Workshop** held in ARIES, Nainital; India (17 - 19 October, 2019). [link]
- **2019** Presented a *poster* titled: **Devasthal Optical Telescope-AGN Reverberation Monitoring(DOT-ARM): Project strategy and initial results** at the international conference titled "Mapping Central Regions of Active Galactic Nuclei" held in in Guilin, Guanxi Province; China (19-24 September, 2019). [link]

Mentoring experience

- **2022:** Mentored a group of 6 students selected from various universities during ARIES Training School on Observational Astronomy (ATSOA) in May 2022.
- **2021:** Guided M Sc. dissertation of Mr. Dharmendra at CUHP, Dharamshala
- **2019:** Mentored a group of 7 students selected from various universities during ARIES Training School on Observational Astronomy (ATSOA) in March 2019.

Outreach ativities

- **2022** Presented a *talk* titled: **Introduction to CosmicVarta: Platform for promoting Indian astronomy research to the public.** at ARIES Training School in Observational Astronomy, Nainital, India (16-27 May 2022).[link]
- **2021:** Co-founded a web portal named **CosmicVarta**, a platform to present simplified versions of research articles in astrophysics to the general public.
- **2021:** Helped in organizing the ARIES National Science Day celebrations (28 February) held online.
- **2020:** Helped in organizing the *ARIES e-lecture series* in place of the ARIES Training School on Observational Astronomy (ATSOA) which was cancelled due to the COVID-19 pandemic.

Professional Memberships:

- Student member of the Astronomical Society of India (ASI).

Publications

1. Photometric and Spectroscopic Analysis of the Type II Short Plateau SN 2020jfo. Ailawadhi, Bhavya (et al. including **Vivek Kumar Jha**) *under revision in Monthly Notices of the Royal Astronomical Society, 2022.*
2. Evidence of Jet induced Optical Microvariability in Radio-loud Narrow Line Seyfert 1 Galaxies. Vineet Ojha,**Vivek Kumar Jha**, Hum Chand, Veeresh Singh, *Monthly Notices of the Royal Astronomical Society, Volume 514, Issue 4, 2022.*
3. Accretion Disk Sizes from Continuum Reverberation Mapping of AGN Selected from the ZTF Survey. **Vivek Kumar Jha**, Ravi Joshi, Hum Chand, Xue-Bing Wu, Luis C Ho, Shantanu Rastogi, Quinchun Ma, *Monthly Notices of the Royal Astronomical Society, Volume 511, Issue 2, 2022.*
4. A comparative study of the physical properties for a representative sample of Narrow and Broad-line Seyfert galaxies. **Vivek Kumar Jha**, Hum Chand, Vineet Ojha, Amitesh Omar and Shantanu Rastogi, *Monthly Notices of the Royal Astronomical Society, Volume 510, Issue 3, 2022.*
5. Properties of Broad and Narrow Line Seyfert galaxies selected from SDSS. **Vivek Kumar Jha**, Hum Chand, and Vineet Ojha, *Communications of the Byurakan Astrophysical Observatory (ComBAO), Volume 67, Issue 2, 2020.*
6. The impact of humidity and film thickness on photoemission, optical and morphological properties of CsI thin film photocathodes. Nabeel Jammal, Richa Rai, Triloki, **Vivek Kumar Jha** and B.K. Singh, *Thin Solid Films, Volume 674, pp:82-90, 2019.*
7. Optical properties of "as-deposited" CsI photocathode in the VUV-UV spectral range. **Vivek Kumar Jha**, Nabeel Jammal, Triloki and B K Singh, *Proceedings of the DAE Symposium on Nuclear Physics Volume 62, pp:1082, 2017.*

References

1. **Dr. Hum Chand**, Professor of Physics, CUHP, Dharamshala. Email: hum (at) aries.res.in
2. **Dr. Abhay Kumar Singh**, Professor of Physics, BHU, Varanasi. Email: singhak (at) bhu.ac.in
3. **Dr. Shantanu Rastogi**, Professor of Physics, DDU, Gorakhpur. Email: shantanur (at) hotmail.com