

Dr. Nitesh Kumar (Ph. D.)

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Employment

2024–present ♦ **Assistant Professor**, Department of Physics, Applied Science Cluster, School of Engineering, UPES, Dehradun – 248007, India.

Education




- 2025 ♦ **Ph.D., Astronomy and Astrophysics**, University of Delhi, Delhi.
Thesis Title: *Automated Analysis of Stellar Photometric and Spectroscopic Astronomical Data*.
Thesis Supervisors: Prof. H. P. Singh (University of Delhi) & Prof. Philippe Prugniel (University of Lyon).
- 2018 ♦ **M.Sc. Physics**, Hansraj College, University of Delhi, Delhi.
Secured 64.20%.
- 2015 ♦ **B.Sc.(H) Physics**, Deshbandhu College, University of Delhi, Delhi.
Secured 80.02%.


Research Interests

- ♦ Application of machine learning to astronomical data.
- ♦ Photometric and spectroscopic analysis of RR Lyrae stars.
- ♦ Stellar spectroscopy, with emphasis on red giants in globular clusters.
- ♦ Big data and computational challenges in astronomy.
- ♦ Investigation of variable stars to understand the structure and evolution of globular clusters.

Research Publications

Journal Articles

- 1 **Nitesh Kumar**, P. Prugniel, and H. P. Singh, “Physical parameters of stars in NGC 6397 using ANN-based interpolation and full spectrum fitting,” *New Astronomy*, vol. 119, p. 102 416, 2025, [IF = 2.1], ISSN: 1384-1076.  DOI: <https://doi.org/10.1016/j.newast.2025.102416>.
- 2 **Nitesh Kumar**, H. P. Singh, O. Malkov, *et al.*, “Extraction of physical parameters of rrab variables using neural network based interpolator,” *Universe*, vol. 11, no. 7, 2025, [IF = 2.6], ISSN: 2218-1997.  DOI: [10.3390/universe11070207](https://doi.org/10.3390/universe11070207).
- 3 **Nitesh Kumar**, A. Bhardwaj, H. P. Singh, M. Rejkuba, M. Marconi, and P. Prugniel, “Multiwavelength photometric study of RR lyrae variables in the globular cluster NGC 5272 (Messier 3),” *Monthly Notices of the Royal Astronomical Society*, vol. 531, no. 3, pp. 2976–2997, May 2024, [IF = 4.7], ISSN: 0035-8711.  DOI: [10.1093/mnras/stae1334](https://doi.org/10.1093/mnras/stae1334).

- 4 **Nitesh Kumar**, A. Bhardwaj, H. P. Singh, *et al.*, “Predicting light curves of RR Lyrae variables using artificial neural network based interpolation of a grid of pulsation models,” *Monthly Notices of the Royal Astronomical Society*, vol. 522, no. 1, pp. 1504–1520, Mar. 2023, [IF = 4.8], ISSN: 0035-8711.  DOI: [10.1093/mnras/stad937](https://doi.org/10.1093/mnras/stad937).

Subjects Taught

- ◇ **M.Sc. (Physics) 1st Semester** (Aug–Dec 2025): Classical Mechanics.
- ◇ **B.Sc. (Hons.) Physics 1st Semester** (Aug–Dec 2025): Computational Techniques.
- ◇ **B.Tech. 1st Year** (Aug–Dec 2025): Physics for Computer Engineers, Physics Lab 1, Physics Lab 2, Physics Lab 3.
- ◇ **M.Sc. (Physics) 2nd Semester** (Jan–July 2025): Introduction to Computational Physics (C++, Fortran, Gnuplot, \LaTeX , Numerical Methods).
- ◇ **B.Sc. (Hons.) Physics 6th Semester** (Jan–July 2025): Fundamentals of Astronomy, Observational Astronomy Lab.
- ◇ **B.Tech. 1st Year** (Jan–July 2025): Physics for Computer Engineers.
- ◇ **Int. B.Sc. + M.Sc. (Physics) 7th Semester** (Aug–Dec 2024): Introduction to Computational Physics (C++, Fortran, Gnuplot, \LaTeX , Numerical Methods), Introduction to Computational Physics Lab.
- ◇ **B.Sc. 1st Semester** (Aug–Dec 2024): Computational Techniques (Python, Gnuplot, \LaTeX).
- ◇ **B.Tech. 1st Semester** (Aug–Dec 2024): Physics Labs.
- ◇ **B.Sc. (Hons.) Physics by Research 7th Semester** (Aug–Dec 2024): Planetary Sciences.

Skills

Coding	◇ Python , C, C++, Fortran, IDL, SQL/ADQL
Web	◇ HTML, CSS, JAVASCRIPT; Git, GitHub
AI	◇ Machine Learning (development & deployment with TENSORFLOW, SCIKIT-LEARN); scientific data analysis
Cloud	◇ Pegasus cluster (IUCAA), large-scale scientific computation
Telescope	◇ Celestron 11" and 8" telescopes (installation, operation, astrophotography)
Academic	◇ Research, teaching, training, consultation, scientific writing, \LaTeX publishing
Language	◇ English, Hindi (proficient: reading, writing, speaking)

Mentorship

- 2025 ◇ **M.Sc. Physics (PG):**
- Stuti — Dolphin (PG) Institute of Biomedical and Natural Sciences, Manduwala, Dehradun, Uttarakhand 248007, India; Dissertation topic: "*Deriving age and metallicity of a Globular Cluster*"
- ◇ **B.Sc. (Hons.) Physics Dissertation:**
- Atharava Bhatele — "*Multiwavelength study of RR Lyrae stars in a Globular Cluster*"
 - Deepa Trivedi — "*Theoretical Period-Luminosity Relationship of Cepheid stars using MESA*"

Mentorship (continued)

- ◇ **B.Sc. (Hons.) Physics by Research, 4th Year:**
 - Neelesh — *"Characterization of Exoplanets using TESS archival data"*
- 2024 ◇ Mentored a group of 5 students in the Summer Internship program organised by Miranda House College, University of Delhi.
- 2019–2024 ◇ **Observational Astronomy Laboratory:** M.Sc. Physics IV semester, Department of Physics & Astrophysics, University of Delhi, India (mentored several master's students in their astronomy lab project work).

National Level Exams

- 2018 ◇ **CSIR JRF/NET**, Cleared CSIR JRF(NET) - Physical Sciences of DECEMBER 2018.
- ◇ **CSIR JRF/NET**, Cleared CSIR JRF(NET) - Physical Sciences of JUNE 2018.
- ◇ **GATE PHYSICS**, Cleared GATE PHYSICS 2018.

Workshops and Conferences

- 2025 ◇ **National Workshop on "Statistical Methods and Data Analysis Techniques in Astrophysics"**
Organized by the Department of Physics and Electronics, Hansraj College, University of Delhi under the aegis of ANRF-DST from 07th - 08th March 2025.
- ◇ **Space Science and Technology Awareness Training (START)**
Participated in the "Future of India's Space Exploration" online training conducted by Indian Space Research Organisation (ISRO) and IIRS, Dehradun, from January 9 to 29, 2025 (19 hours 30 minutes duration).
- 2024 ◇ **Introductory Workshop on Astronomy and Astrophysics (Resource Person)**
Organized by the Department of Physics at Dolphin PG Institute of Biomedical and Natural Sciences, Dehradun in collaboration with IUCAA, Pune from December 18 to 20, 2024. (Invited Talk).
- ◇ **Workshop on Probing Stars and Galaxies Using Innovative Data Science Tools (Resource Person)**
Organized by the Department of Applied Sciences, Gauhati University in collaboration with the Department of Physics & Astrophysics, University of Delhi, IUCAA, Pune, and NIF, Gandhinagar, from September 4 to 6, 2024. (Paper Presentation).
- 2023 ◇ **Pedagogic Workshop on Astronomy, Astrophysics and Cosmology**
Organized by St. Stephen's College, University of Delhi, from November 6 to 10, 2023.
- ◇ **Workshop on Stellar and Dynamical Evolution**
Organized by Miranda House College, University of Delhi, from October 3 to 5, 2023.
- 2022 ◇ **Indo-French Astronomy School (IFAS 7)**
Participated in the school on *Spectroscopy and Spectrographs*, hosted at IUCAA, Pune, from November 21 to 27, 2022.

Workshops and Conferences (continued)

- ◇ **Young Astronomers' Meet (YAM 2022)**
Presented "Application of Artificial Neural Networks in Generating RR Lyrae Light Curves" at ARIES, Nainital, from November 9 to 13, 2022.
 - ◇ **International Staff Week 2022**
Attended with the theme "*Internationalization in the New Era*" at WSB University, Dąbrowa Górnicza, Poland, from May 16 to 20, 2022 (Received ERASMUS+ Grant for attending the workshop).
 - ◇ **European Astronomical Society Annual Meeting (EAS 2022)**
Participated in the annual meeting, held from June 27 to July 1, 2022.
 - ◇ **Faculty Development Program (FDP) Workshop on RTCISM**
Engaged in a one-week FDP on "*Recent Trends and Challenges in Intelligent Systems and Machines (RTCISM)*", organized by Amity University Patna, from July 25 to 29, 2022.
- 2021
- ◇ **Code/Astro**
Completed a 40-hour course on Python-based software development for astronomers, covering software paradigms, version control, testing, documentation, packaging, and profiling.
 - ◇ **39th Annual Meeting of the Astronomical Society of India (ASI 2021)**
Presented a poster on "*Spectral Interpolation using Artificial Neural Networks (ANN)*" at the virtual ASI Annual Meeting hosted by ICTS-TIFR Bengaluru, IISER Mohali, IIT Indore, and IUCAA Pune, from February 18 to 23, 2021. [https://astron-soc.in/asi2021/abstract_details/ASI2021_66]
- 2020
- ◇ **Indo-French Astronomy School (IFAS 6)**
Participated in the *6th IFAS - Treasures in the Voxels*, held online by the Centre de Recherche Astrophysique de Lyon, from July 9 to 17, 2020.

Invited Talks

- 2025
- ◇ Delivered an expert talk titled "Measuring the Universe: The cosmic distance ladder" at Government Mahila Degree College, Budaun, Uttar Pradesh, India, on April 26, 2025.
- 2024
- ◇ Delivered an invited lecture on "Basics of Telescopes and How to Use Them for Night Sky Observations" at Dolphin (PG) Institute of Biomedical and Natural Sciences, Dehradun, Uttarakhand, India.
- 2023
- ◇ Delivered an expert talk titled "Introduction to Astronomy" at Government Degree College, Budaun, Uttar Pradesh, India, on January 16, 2023.

Miscellaneous

- 2023
- ◇ Served as a reviewer for a manuscript submitted to *The Astronomical Journal* (AAS), an international journal (Impact Factor: 5.491).
- 2022
- ◇ Acted as subject matter expert for the assessment and translation of the first-year engineering SWAYAM course "Quantum Mechanics - I" into Hindi.
 - ◇ Developed the project website: <https://ann-interpolator.web.app/>.

References

Prof. Harinder P. Singh

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