Sanjana Gupta

530 McCormick Road, Room 267, Charlottesville, VA 22904 | +1 (434) 358-5366 | +91-9433581344 |
xqh5af@virginia.edu | sanjana.gupta207@gmail.com | sgupta@nrao.edu |

Current Interests

Multiwavelength Observations of Stripped Envelope Supernovae, SN-GRB connection

Education

- **University of Virginia, Charlottesville, USA**
  - **Ph.D in Astronomy** Advisor: Dr. Poonam Chandra *Current GPA: 4.0/4.0* *2025 – 2030*
- **Ashoka University, Sonepat, India**
  - **PG Diploma in Advanced Studies & Research** *2024 – 2025*
    Advanced Major in Physics, Minors in Astronomy and Chemistry, GPA: 3.88/4.0
  - **Bachelor of Science Honours** *2021 – 2024*
    Major in Physics, GPA: 3.7/4.0 | Transcript | Course Descriptions
- **The BSS School (West Bengal Council of Higher Secondary Education), Kolkata, India**
  - **Higher Secondary Education, Science** | Grade: 90.4%, 99%tile | Transcript *2006 – 2021*

Research & Projects

- **UG Thesis: Probing Neutron Star Matter Using Multimessenger Timing Results** *Aug 2024 - May 2025*
  Tools: XSPEC, LORENE, CompOSE, python [GitHub]
  - Constructed theoretical models of neutron stars with candidate equations of state and constraining them through observed properties such as mass, radius, moment of inertia, and tidal deformability.
  - Supervisor: Dr. Dipankar Bhattacharya, Ashoka University
- **Protostellar Outflows** *May 2024 - Aug 2024*
  Tools: SAOImageDS9, PLUTO, python [GitHub]
  - Identified and analyzed protostellar outflows from ALMA mm data and simulated outflows on PLUTO.
  - Supervisor: Dr. Tapas Baug, S. N. Bose National Centre for Basic Sciences.
- **Exoplanet Validation: VaTEST** *Dec 2023 - Dec 2024*
  Tools: lightkurve, triceraopcs, juliet [Web]
  - Using statistical tools and Python packages to validate unconfirmed planets - upcoming paper.
  - Supervisor: Priyashkumar Mistry, PhD student, University of New South Wales
- **Electron transfer mediated decay for the Auger final state of microsolvated ions** *Sep 2023 - Apr 2024*
  Tools: GAMESS
  - Studying Quantum Chemistry and analyzing sodium-water systems using GAMESS software.
  - Supervisor: Dr. Aryya Ghosh, Ashoka University
- **Climate and Habitability of Earth-like Exoplanets modeled using GCM codes** *Sep 2022 - May 2025*
  Tools: ROCKE-3D, python
  - Studying the effects of obliquity and continental configuration on exoplanetary climates through simulations - aiming towards publication.
  - Supervisor: Dr. Alak Ray, Tata Institute of Fundamental Research
- **Gamma-Ray Bursts** *Jul 2021 - Mar 2022, Jan 2023 - Apr 2023*
  Tools: Mathematica, python [Web]
  - Assisted Dr. Maria Dainotti at NAOJ with her research on Gamma Ray Bursts, acknowledged in The Optical Two and Three-Dimensional Fundamental Plane Correlations for 180 Gamma-Ray Burst Afterglows with Swift/UVOT, RATIR, and the SUBARU Telescope.

Research Output

[JOURNAL] **Gupta, S.**, Kaushal, I., Shiny, S. M., & Priya, J. K. (2022). **Study on the characteristics of exoplanets: Review**. *Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal*, 11, 40–57.

[CONFERENCE] **Gupta, S.**, Kaushal, I., & Shiny, S. M. (2022). **Occurrence Rate of Super-Earths Around Binary Star Systems**. In *Proceedings of the International Conference on Research in Multidisciplinary Studies*, pp. 152–160.

[POSTER] **Gupta, S.**, Sharma, S., & Ray, A. (2023). **Climate & Zonal Habitability of Exoplanets modeled with GCM codes: Effect of Continents & Obliquity**. Strange New Worlds: The Exploration of Exoplanets, Indian Institute of Science Education and Research, Pune.

[POSTER] Sharma, S.,**Gupta, S.** & Ray, A. (2025). **Computational simulation of the characteristics of the Climate and habitability of Earth-like exoplanets**. DAA Annual Interaction Meeting (DAIM) 2025, TIFR, Mumbai.

Competitively Awarded Observing Time

- **GMRT Type Ic-BL Supernova proposal:** Principal Investigator of a GMRT proposal awarded observing time to probe late-time radio emission from Type Ic-BL supernovae at low frequencies (12 hours)
- **GMRT Stripped-Envelope Supernova survey proposal:** Co-Investigator of a GMRT proposal awarded observing time to complete a volume-limited survey of five stripped-envelope supernovae, focusing on circumstellar interaction (20 hours)
- **GMRT GLIMPSE survey (main program):** Co-Investigator of a GMRT proposal awarded observing time for a low-frequency investigation of massive progenitors of supernova explosions
- **GMRT GLIMPSE follow-up program:** Co-Investigator of GMRT proposals awarded multiple epochs of observing time to follow up radio-bright young core-collapse supernovae at low frequencies

Observing Experience

- **APO 3.5m Telescope:** Primary Instrument: TripleSpec to observe SN 2018ivc

Computer Skills

- **Programming Languages:** Python, LaTeX(Advanced); Mathematica, Bash (Intermediate); R, C++, Fortran (Basic)
- **Software:** CASA, HEASOFT, IRAF; SAOImageDS9, Siril, friendlyVRI, MaxIm DL, WinJUPOS (Astronomical Imaging); PLUTO, MERCURY, ROCKE-3D, RACIPE (Simulation and Modeling); ImageJ, Physics Tracker (Image Analysis); GAMESS, GROMACS, Avogadro (Computational Chemistry)

Teaching and Course Development

- **Graduate Teaching Assistant** for ASTR 1220: Introduction to Stars, Galaxies and the Universe taught by Dr. Maryam Modjaz & ASTR 3470: Science and Controversy in Astronomy taught by Dr. Matthew Pryal, University of Virginia *Aug - Dec 2025*
- **Teaching Assistant** for the Continued Mentorship Initiative, Lodha Genius Programme, providing personalized guidance to LGP students, supporting them in navigating academic and professional development. *Sep - Dec 2024*
- **Teaching Assistant** for Physics Lab IV: Quantum Mechanics and Statistical Mechanics, taught by Dr. Pramoda Kumar. *Aug 2024 - Dec 2024*
- **Teaching Assistant** for the Astronomy course of the Lodha Genius Program, taught by Dr. Aswin Sekhar of the Paris Observatory. Conducted observational astronomy sessions for select bright students in grade 12 and explained undergraduate Astronomy Curriculum at the high school level. *May - Jun 2024*
- **Curriculum Developer**. Collaborated with Madhukar Soni to develop an astronomy curriculum for school students using a self-sustaining business model. *Dec 2022 - July 2023*

Awards and Achievements

- Dean's List, Ashoka University *Semesters 1-4, 6-8*
- The Shubhra Kar Linux Foundation Training (LiFT) Scholarship *June 2023*
- Gold Honour in the International Astronomy and Astrophysics Competition *June 2023*
- Innovation in Science Pursuit for Inspired Research (INSPIRE) Scholarship, Department of Science and Technology, Government of India *June 2022*
- Bronze Honour in the International Astronomy and Astrophysics Competition *July 2022*

Certifications

- **Science:** Basic Course in Astronomy, Introduction to Stars, The Complete High School and College Physics, The Story of Photoelectric Effect, SAR Data Processing, Introduction to Astrophysics, Understanding Nuclear Energy
- **Technical:** Programming for Everybody (Getting started with Python), Data Science Tools, Complete Machine Learning & Data Science with Python, Build a Face Recognition Application Using Python, Introduction to Linux, Introduction to C++
- **Others:** Microsoft PowerPoint, Microsoft Word, Technical Writing and Document Preparation using LaTeX

Conferences & Workshops Attended

- **ZTF Summer School - Astronomy Data Science in the Rubin Era**, Virtual *July 2025*
- **BRICS Astronomy & IDIA Data Analytics Training Program**, Virtual - Capstone: Predicting Supernova Confirmation type from host galaxy properties *May - Jul 2025*
- **Astrophysical Dust Ices: Insights from recent telescopes**, Physical Research Laboratory, Ahmedabad *March 2025*
- **Conference on Blazars and Restless AGN (COBRA): A High-Energy View** (By Presidency University, Kolkata, Inter-University Centre for Astronomy and Astrophysics (IUCAA)) *July 2024*
- **Frugal Science** (By Manu Prakash, Esteemed Bio-engineer at Stanford University) *Jan - April 2024*
- **AstroCosmoCon** Workshop on Astronomy, Cosmology and Atmospheric Research, The Thanu Padmanabhan Centre for Cosmology and Science Popularisation, SGT University *Oct 2023*
- **BUFFET** (Building a Unified Framework For Exoplanet Treatments, second edition): A CUISINES (Climates Using Interactive Suites of Intercomparisons Nested for Exoplanet Studies) virtual workshop *Oct 2023*
- **Mathematical Modelling of Engineering Dynamical Systems** and **Monte Carlo Methods in Statistical Field Theories**, Remote Experience for Young Scientists and Researchers, University of California, Berkeley, and Old Dominion University *Jul 2023 - Sep 2023*
- **Climate, Ocean and Atmosphere Processes**, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research *Jun 2023*
- **Physics of Life Monsoon School**, National Centre for Biological Sciences, Tata Institute of Fundamental Research - Project and Talk Title: Resilience of Gene Network Cores to Perturbations in the Periphery *Jun 2023*
- **Introduction to Fusion Energy and Plasma Physics Course**, Princeton Plasma Physics Laboratory *Jun 2023*
- **Qubit by Qubit Quantum Winter School**, The Coding School and Microsoft Azure *Feb 2023*
- **Sokendai Asian Winter School** 2023, **Sokendai Asian Winter School** 2022 *Feb 2023, Feb 2022*
- **National Initiative On Undergraduate Sciences** (NIUS) Astronomy Camp 19.1, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research *Jun 2022 - Jul 2022*
- **Data Science Summer School**, Hertie School *Jul 2022 - Aug 2022*
- **Qiskit Global Summer School** on Quantum Simulations, IBM *Jul 2022 - Aug 2022*
- **Gaia Symposium: DR3 And Beyond**, Indian Institute of Astrophysics *Jul 2022*
- Indian Association for **General Relativity and Gravitation Summer School**, IIT, Gandhinagar *May 2022*

Leadership & Outreach Experience

- Member, Dark Skies Bright Kids, Department of Astronomy, University of Virginia *Sep 2025 - Present*
- President; Executive Head, Astronomy Society of Ashoka University *June 2024 - May 2025; Apr 2023 - June 2024*
- Section Reviewer and Editor, jIAPS (the International Association of Physics Students journal) *Jan 2024 - May 2024*
- Secretary, Delhi Local Committee, International Association of Physics Students *Sep 2023 - Jan 2024*
- Undergraduate Physics Representative, Ashoka University *May 2023 - May 2024*
- Member of Growth Department, IEEE Student Branch at Ashoka University *Mar 2023 - Jan 2024*
- School Captain; Assistant Head Girl, The BSS School *2017-2019; 2020-2021*

Citizen Science

- Zooniverse; Projects contributed to: Planet Hunters, Muon Hunter Classic, Local Group Cluster Search and Disk Detective; Disk Detective Advanced User *Jul 2019 - May 2025*
- International Astronomical Search Collaboration, NASA *Nov - Dec 2021*
- International Centre for Radio Astronomy Research *Sep 2021 - Apr 2022*
- The VASCO Citizen Science Project *Sep 2021 - Apr 2022*