
[Dr. Mayank Narang](#)

ASIAA Postdoctoral Research Fellow

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Education

- **Tata Institute Of Fundamental Research, Mumbai, India**

Integrated Master's and Ph.D., 2015 - 2022.

Cumulative Performance Index (CPI) for Master's 83.6/100

Thesis advisor: Prof. Manoj Puravankara

Thesis title: From Protostars to Exoplanets: Formation and Evolution of planetary systems

- **Sri Venkateswara College, University of Delhi, Delhi, India**

B.Sc. (Physics) Hons, 89.7%, 2014.

Research

During my Ph.D. the primary objective of the research was to investigate the relationship between the composition of the host stars of an exoplanet and the properties of the planets orbiting them. This involved a comprehensive study of the chemical and physical characteristics of both the host stars and the exoplanets, to identify any correlations that could provide insights into the formation and evolution of planetary systems. My research has now expanded to include the study of protostars using JWST, with a particular focus on the jets and outflows emanating from these young stellar objects. This is an area of active research, as protostars are believed to be the birthplaces of stars and planets, and understanding their behavior can provide valuable insights into the early stages of stellar and planetary formation.

Selected committees and research groups

- Part of the ALMA large program Early Planet Formation in Embedded Disks (eDisk)
- Co-I in the cycle 1 GO JWST program Investigating Protostellar Accretion (IPA)
- Organizing committee of Lunch talks and seminars at ASIAA, Taipei, Taiwan
- Former member of the Science popularization and outreach committee at TIFR, Mumbai, India

Skill sets

Extensive experience at coding with Python, SQL, Big Data, Bayesian and Markov chain Monte Carlo (MCMC) analysis, statistical analysis and data visualization,

Selected conference talks and posters

- **Annual Meeting of the Physical Society of Taiwan, National Central University (NCU), 2024**
 - Talk (Zooming in on protostellar outflows: A Combined JWST and ALMA Study of the very low mass protostar IRAS 16253-2429)
- **Probing the Universe at Higher Resolution, ASIAA, 2023**
 - Talk (Zooming in on protostellar outflows: A Combined JWST and ALMA Study of the very low mass protostar IRAS 16253-2429)
- **Talk: Investigating the formation of giant planets, ASIAA, 2023**
- **Protostars and Planets VII, Kyoto, Japan, 2023**
 - Poster (*Kinematics of exoplanet host stars. Are Jupiter hosting stars young*)
- **East Asian ALMA workshop, Taipei, Taiwan 2023**
 - Talk (The ALMA-JWST synergy: Mapping protostars at high resolution)
- **Indian Planetary Science Conference (IPSC-2022)**
 - Talk (*Kinematics of exoplanet host stars. Are Jupiter hosting stars young*)
- **21st National Space Science Symposium (NSSS)**
 - Talk (*Kinematics of exoplanet host stars. Are Jupiter hosting stars young*)
- **A high-energy view of exoplanets, 2021**
 - Poster (Star planet interaction in the UV domain)
- **UK-EXO meeting, 2021**
 - Talk (*Kinematics of exoplanet host stars*)
- **39th Meeting of Astronomical Society of India (ASI), 2021**
 - Poster (*Kinematics of exoplanet host stars*)
- **Gaia Symposium: DR2 and Beyond, Indian Institute of Astrophysics, Bengaluru, 2020**
 - Talk (*Optical detection of protostars with Gaia*)
- **NYRIA 2020, (Virtual meeting), 2020**
 - Talk (*Design challenges in building a Multi-Object-IR-Spectrograph*)
- **Exoplanet III meeting at Heidelberg, 2020**
 - Talk (*Star planet interaction in UV and radio domain*)
- **38th Meeting of Astronomical Society of India (ASI), IISER Tirupati, Tirupati, 2020**
 - Poster (*Optical detection of protostars with Gaia*)
- **Science with Subaru, TIFR, Mumbai, 2019**
 - Key member of LOC
- **India TMT meet, ARIES Nainital 2019**
 - Talk (*The role of TMT in improving our understanding of exoplanet systems*)

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- **Meterwave Sky II, NCRA, Pune, 2019**
 - *Poster (Radio emission from exoplanets)*
 - **37th Meeting of Astronomical Society of India (ASI), Christ University, Bengaluru, 2019**
 - *Poster (Properties of planets around evolve host stars)*
 - **National Space Science Symposium, University Pune, 2019**
 - *Talk (Dependence of host star properties on planet properties)*
 - **International conference on Exoplanets, IIA, Bengaluru, 2019**
 - *Talk (Current exoplanet demographics)*
 - **YAM 2018 at PRL, Ahmedabad**
 - *Talk (Dependence of host star properties on planet properties)*
 - **36th Annual Meeting of the Astronomical Society of India (ASI), Hyderabad, 2018**
 - *Talk (Dependence of host star properties on planet properties)*
 - **Sakura Science Exchange, Osaka University, Osaka, Japan, 2018**
 - *Talk (Dependence of host star properties on planet properties)*
 - **35th Annual Meeting of the Astronomical Society of India (ASI), Jaipur, India, 2017**
 - *Poster (Occurrence rate of Transitional disks)*
 - **Star and Planet Formation: Insights and Intricacies, IIST, India, 2016**
 - *Talk (Occurrence rate of Transitional disks)*

Teaching Assistant

- Astronomy and Astrophysics I, 2020
- Astronomy and Astrophysics I, 2019
- Astronomy and Astrophysics I, 2017
- Statistical Mechanics, 2017
- Electrodynamics I, 2016

Students mentored

- **Nitish Ujwal, 2019** (IIT Bombay)
 - A GMRT study of radio emission from exoplanets
- **Prachi Mishra, 2019** (Delhi University)
 - Mass-radius relation for exoplanets
- **Gayathri Viswanath, 2018** (formerly at Christ University Bangalore, now at Stockholm University)
 - Star planet interaction in UV domain

Selected Awards and Medals

Best paper presentation award

National Space Science Symposium, Pune, 2019

Award For Excellence for Departmental Topper B.Sc. (Physics) Hons,

- 2013-2014
- 2012-2013
- 2011-2012

Bharatula Savitri memorial prize (For rank 1 in the department)

B.Sc. (Physics) Hons, 2013-2014

Sri Padmavati Ammavari medal (For rank 1 in the department)

B.Sc. (Physics) Hons, 2013-2014

Publications

Refereed publications

1. A uGMRT search for radio emission from planets around evolved stars
Mayank Narang, Manoj P et al., **accepted at MNRAS**
2. Discovery of a Collimated Jet from the Low-luminosity Protostar IRAS 16253-2429 in a Quiescent Accretion Phase with the JWST
Mayank Narang, Manoj P et al. **2024 ApJ 962L 16**
3. JWST observations of $^{13}\text{CO}_2$ ice: Tracing the chemical environment and thermal history of ices in protostellar envelopes
Brunken, Nashanty, Rocha, Will R. M. + **Mayank Narang accepted at A&A**
4. Hunt for complex cyanides in protostellar ices with JWST: Tentative detection of CH_3CN and $\text{C}_2\text{H}_5\text{CN}$
Nazari, P. , Rocha, W. R. M + **Mayank Narang accepted at A&A**
5. Optical spectroscopy of Gaia detected protostars with DOT: Can we probe protostellar photospheres?
Mayank Narang, Manoj P et al. **2023 Journal of Astrophysics and Astronomy, Volume 44, Issue 2, article id.92**
6. Identifying the population of T-Tauri stars in Taurus: UV-optical synergy
Nayak, Prasanta, **Mayank Narang** et al., **2023 Journal of Astrophysics and Astronomy, Volume 44, Issue 2, article id.83**
7. MOIS: a configurable slit multi-object infrared spectrograph
Surya A, Manoj P + **Mayank Narang**, **2023 Proceedings of the SPIE, Volume 12677, id. 126770A 14 pp.**
8. Age distribution of exoplanet host stars: Chemical and Kinematics age proxies from GAIA DR3"
C.Swastik, Ravinder K. Banyal, **Mayank Narang** et al., **2023 AJ 166 91**
9. UV Spectral Characterization of Low-mass Stars with AstroSat UVIT for Exoplanet Applications: The Case Study of HIP 23309
Ranjan, S; Nayak, P; Pineda, J. S; **Mayank Narang 2023 AJ 166 70**

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10. Fullerenes in the circumstellar medium of Herbig Ae/Be stars: insights from the Spitzer mid-infrared spectral catalog
R. Arun, Blesson Mathew, Manoj P + **Mayank Narang 2023 MNRAS 523 1601**
 11. uGMRT observations of the hot-Saturn WASP-69b: Radio-Loud Exoplanet-Exomoon Survey II (RLEES II)
Mayank Narang ; Oza, Apurva V.; Hakim, Kaustub, Manoj P, et al., 2023, **MNRAS 522 1662**
 12. Extension of HOPS Out to 500 ParSecs (eHOPS). I. Identification and Modeling of Protostars in the Aquila Molecular Clouds
Pohrel, Riway + **Mayank Narang 2023, ApJS, 266, 32P**
 13. 300: An ACA 870 μm Continuum Survey of Orion Protostars and Their Evolution
Federman,S + **Mayank Narang 2023, ApJ, 944, 49**
 14. Radio-loud Exoplanet-exomoon Survey: GMRT Search for Electron Cyclotron Maser Emission
Mayank Narang ; Oza, Apurva V.; Hakim, Kaustub, Manoj P et al., **2023, AJ, 165, 1**
 15. Emission line star catalogues post-Gaia DR3. A validation of Gaia DR3 data using the LAMOST OBA emission catalogue
Shridharan, B + **Mayank Narang, 2022, A&A, 668, 156**
 16. The nature of the radio source detected towards the exoplanet system 1RXS1609.1-210524
Mayank Narang 2022, MNRAS, 515, 2015
 17. Carbon abundance of stars in the LAMOST-Kepler field
Athira Unni, **Mayank Narang**, T. Sivarani, P. Manoj, et al **2022, AJ, 164, 181**
 18. Chemical analysis of exoplanet host stars: Are high-mass planetary systems young?
C.Swastik, Ravinder K. Banyal **Mayank Narang** , P. Manoj, T. Sivarani, , S. P. Rajaguru, **2022, AJ, 164, 60**
 19. The Rate, Amplitude and Duration of Outbursts from Class 0 Protostars in Orion
Wafa Zakri, S. T. Megeath + **Mayank Narang, 2022, ApJL, 924, 23**
 20. Clustering of low-mass stars around Herbig Be star IL Cep - evidence of 'Rocket Effect' using Gaia EDR3?
R. Arun, Blesson Mathew, + **Mayank Narang, 2021, MNRAS, 507, 267**
 21. Host star metallicity of directly imaged wide-orbit planets: implications for planet formation
C.Swastik, Ravinder K. Banyal, **Mayank Narang**, et al. **2021, AJ, 161, 114**
 22. In search of radio emission from exoplanets: GMRT observations of the binary system HD 41004
Mayank Narang, Manoj P, et al. **2021, MNRAS, 500, 4818**
 23. Discovery of an M-type Companion to the Herbig Ae Star V1787 Ori
R. Arun, Blesson Mathew, Sridharan Rengaswamy, P. Manoj, **Mayank Narang**, et al. **2021, MNRAS , 501, 1243**
 24. A Statistical Search for Star-Planet Interaction in the Ultraviolet Using GALEX

Viswanath, G., **Mayank Narang**., Manoj, P., Blesson Mathew, Sreeja S Kartha, **2020, AJ, 159, 194**

25. Analysis of Membership Probability in Nearby Young Moving Groups with Gaia DR2
K. Ujjwal, Sreeja S. Kartha, Blesson Mathew, P. Manoj, **Mayank Narang**, **2020, AJ, 159, 166**
26. On the Mass Accretion Rate and Infrared Excess in Herbig Ae/Be Stars
R. Arun, Blesson Mathew, P. Manoj, K. Ujjwal, Sreeja S. Kartha, Gayathri Viswanath, **Mayank Narang**, K.T. Paul **2019, AJ 157, 159**
27. Properties and Occurrence Rates for Kepler Exoplanet Candidates as a Function of Host Star Metallicity from the DR25 Catalog
Mayank Narang, P. Manoj, et al. **2018, AJ, 156, 221**
28. Excitation mechanism of OI lines in Herbig Ae/Be stars
Mathew, Blesson, Manoj, P., **Mayank Narang**, et al. **2018, ApJ, 857, 30**

Papers under-review

1. Investigating Protostellar Accretion-Driven Outflows Across the Mass Spectrum: JWST NIRSpec IFU 3-5 micron Spectral Mapping of Five Young Protostars
Federman, Samuel, Megeath, Thomas ; + **Mayank Narang under review ApJ**
2. IPA. Class 0 Protostars Viewed in CO Emission Using JWST/NIRSpec
Rubinstein, Adam, Tyagi, Himanshu + **Mayank Narang under review ApJ**
3. JWST/MIRI detection of suprathreshold OH rotational emissions: probing the dissociation of the water by Lyman alpha photons near the protostar HOPS 370
David Neufeld, Manoj P, Tyagi Himanshu, **Mayank Narang** et al. **under review ApJL**
4. Light Shining Through Wall Bounds on Axions From Obscured Magnetars
Chattopadhyay Dibya, Dasgupta Basudeb, Dighe Amol, **Mayank Narang under review PRD**

Non-refereed publications

1. Investigating Accretion onto Protostars: 25 Years of Infrared Observations from the Air and Space
Megeath, Thomas ; Kulkarni, C ; Burns--Watson, N ; Zakri, W ; Fischer, W ; **Mayank Narang**
Manoj P et al., **Physics and Chemistry of Star Formation: The Dynamical ISM Across Time and Spatial Scales. Proceedings of the 7th Chile-Cologne-Bonn Symposium, held 26-30 September, 2022 in Puerto-Varas, Chile**
2. GMRT Observations of the Exoplanetary Systems τ Boötis and 55 Cancri
Mayank Narang, Manoj, P., & Ishwara Chandra, C.~H. **2021, Research Notes of the American Astronomical Society, 5, 158.**
3. From the margins to the mainstream: Nobel celebrates exoplanets!
Manoj, P., R. Banyal, **Mayank. Narang**, **2019, Indian Physics Association Physics News, 49, 15**