

Jasjeet Singh Bagla

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Personal Information

Name	Jasjeet Singh Bagla
Date of Birth	July 09, 1969
Sex	Male
Nationality	Indian

Educational Qualifications

Year	Degree	University	Division
1997	Ph.D.	University of Pune	
1992	M.Sc. Physics	University of Delhi	I
1990	B.Sc. Physics	University of Delhi	I

- **Title of Ph.D. Thesis :** Gravitational Clustering in an Expanding Universe.
- **Thesis Supervisor :** T.Padmanabhan

Affiliations

From – To	Position	Institute/Department
Aug.1992 – Oct.1996	Research Scholar	IUCAA, Pune, India
Nov.1996 – Oct.1998	Post-doctoral Fellow	Institute of Astronomy, Cambridge, U.K.
Oct.1998 – Nov.1999	Post-doctoral Fellow	Harvard-Smithsonian Center for Astrophysics, Cambridge, USA
Nov.1999 – Jan.2001	Fellow (D)	Harish-Chandra Research Institute, Allahabad, India
Feb.2001 – Jan.2002	Fellow (E)	Harish-Chandra Research Institute, Allahabad, India
Feb.2002 – Jan.2003	Reader (E)	Harish-Chandra Research Institute, Allahabad, India
Feb.2003 – Jan.2007	Assoc.Prof. (F)	Harish-Chandra Research Institute, Allahabad, India
Feb.2007 – May 2011	Professor (G)	Harish-Chandra Research Institute, Allahabad, India (On Lien during July 19, 2010 – May 31, 2011)
July 19, 2010 – October 28, 2020	Professor	IISER Mohali, India
October 29, 2020 –	Professor (HAG)	IISER Mohali, India

Awards and Fellowships

- I was a regular associate of the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste for the period 2014-2019.
- PPARC (Particle Physics and Astronomy Research Council) funded Postdoctoral research associateship at the Institute of Astronomy, Cambridge University, Cambridge, UK from Nov.1996 to Oct.1998.
- CSIR (Council of Scientific and Industrial Research) NET-JRF fellowship, 1992–1996.
- CARPA (Centre for Advanced Research in Physics and Astrophysics) scholarship, 1990-1992.

Membership of Societies

- I am a member of the International Astronomical Union. Members are nominated by a national committee from every country. There are about 300 members from India.
- I am a member of the Astronomical Society of India.
- I am a member of the Indian Association for General Relativity and Gravitation.

Miscellaneous

Editorial Responsibilities

- I am a member of the editorial board of the journal *New Astronomy* since November 1, 2022.
- I am a member of the editorial board of *Resonance* as an Associate Editor for the period Jan.2021 – Dec.2026.

- I was a member of the Editorial board for the journal *Research in Astronomy and Astrophysics* during 2009-2013. The Chinese Journal of Astronomy and Astrophysics was relaunched in this form in Jan.2009 with the view of giving it an international flavour. Details of the journal are available at <https://www.raa-journal.org/raa/index.php/raa>.

Academic Committees

- I am the chair of the Scientific Organizing Committee for the Astronomical Society of India for annual meetings of the society to be held during 2023-2025.
- I am a member of the working group and drafting group for the Astronomy and Astrophysics component of the *Mega Science Vision-2035 Exercise for India*.
- I am a member of the IUCAA JNU academic committee. This committee oversees academic activities of PhD students at IUCAA. The students are enrolled at JNU (Jawaharlal Nehru University) and do their work at IUCAA Pune.
- I was a member of the programme advisory committee (PAC) in the area of Physics, Astrophysics and Lasers for considering bilateral proposals submitted to the Department of Science and Technology (DST) under the International Bilateral Cooperation Division (IBCD) during 2020-2022.
- I have been a member of the IAU working group on inclusive astronomy outreach since 2019.
- I was a member of *the Academic Council of the National Resource Centre in Astronomy and Astrophysics* at IUCAA, Pune starting June 2018.
- I was a member of the council of *Indian Association for General Relativity and Gravitation* for the period 2016-2019.
- I was a member of the council of the BRICS Association of Gravity, Astrophysics and Cosmology. The association has been formed as a part of the developing collaboration between BRICS countries (Brazil, Russia, India, China, and, South Africa) in order to set up a multi-lateral platform for collaborations, exchange visits and joint meetings.
- I was a member of the academic committee for the International Olympiad on Astronomy and Astrophysics (IOAA) held at NISER Bhubaneswar in Dec.2016.
- I was a member of the NCRA-TIFR Management Board during June 2015 - June 2018.
- I was the chairperson of the GMRT (Giant Meterwave Radio Telescope) Time Allocation Committee (TAC) during 2012-2015. The task of GMRT-TAC is to invite proposals from scientists worldwide for using the GMRT. The proposals are peer reviewed and GMRT-TAC makes the decision on allocating observation time to various proposals. The total observing time is over-subscribed by a factor of more than two. Details about the GMRT are available at <http://www.ncra.tifr.res.in/ncra/gmrt>.
- I was a member of the International Science Development Team (ISDT) for *Cosmology and Fundamental Science* for the TMT (Thirty Meter Telescope) during 2011-2015. The task for this team is to develop and list science goals with sufficient clarity so that these can serve as a guide for designing instruments for the telescope.
- I was a member as well as the secretary of the National Committee of IAU (ICSU-IAU) during 2008 – 2015. This committee is constituted by the Indian National Science Academy.

- I was the secretary of the Astronomical Society of India for three years starting Jan.2010. Please see more details of the society at <https://www.astron-soc.in/>.
- I was a member of the panel on *Theoretical Astrophysics* that prepared the *Decadal Vision Document* for Astronomy & Astrophysics. Six different panels were set up to summarise the present status in the International and Indian context and recommend directions in which future developments are likely to take place. The Indian Academy of Sciences (Bangalore) funded this project to encourage long term planning and to identify key projects for the coming decade. The report has been published by the academy. The document is available at [this link](#).

Miscellaneous

- I have been appointed an independent director of the company *Netweb Technologies* starting February 2023. This company specializes in providing hardware and services for high performance computing and storage.
- I was a founding member of the *Working Group for Gender Equity of the Astronomical Society of India* during 2015-2019.

List of Publications

Peer Reviewed Research Journals

1. Ankit Singh, Shreya Davessar, Mamta Gulati, Jasjeet Singh Bagla, Meenu Prajapati, 2024, *Study of dependence of ram pressure stripping on the orbital parameters of the galaxies*, MNRAS, Accepted.
2. Ashish Kumar Meena, J. S. Bagla, 2023, *Exotic Image Formation in Strong Gravitational Lensing by Clusters of Galaxies – IV. Elliptical NFW Lenses and Hyperbolic Umbilics*, MNRAS **526**, 3902-3919
3. Apurba Bera, Nissim Kanekar, Jayaram N. Chengalur, J. S. Bagla, 2023, *The Gas Accretion Rate of Star-forming Galaxies over the last 4 Gyr*, ApJL **956**, L15
4. Apurba Bera, Nissim Kanekar, Jayaram N. Chengalur, J. S. Bagla, 2023, *Atomic Hydrogen Scaling Relations at $z \simeq 0.35$* , ApJL **950**, L18
5. S. Gavas, J. S. Bagla, N. Khandai, G. Kulkarni, 2023, *Halo mass function in scale invariant models* MNRAS **521**, 5960.
6. S. Bharti and J. S. Bagla, 2022, *Upcoming SKA precursor surveys and sensitivity to HI mass function*, Journal of Astrophysics and Astronomy **43**, 95.
7. R. Ramesh, A. K. Meena, and J. S. Bagla, 2022, *Wave effects in double-plane lensing*, Journal of Astrophysics and Astronomy **43**, 38.
8. A. K. Meena, A. Mishra, A. More, S. Bose, and J. S. Bagla, 2022, *Gravitational lensing of gravitational waves: Probability of microlensing in galaxy-scale lens population*, MNRAS **517**, 872-884.
9. A. Bera, N. Kanekar, J. N. Chengalur, and J. S. Bagla, 2022, *The HI Mass Function of Star-forming Galaxies at $z = 0.35$* , ApJL **940**, L10.
10. A. K. Meena and J. S. Bagla, 2022, *Exotic image formation in strong gravitational lensing by clusters of galaxies - III. Statistics with HUDF*, MNRAS **515**, 4151-4160.
11. R. Ramesh, A. K. Meena, and J. S. Bagla, 2022, *Gravitational lensing of core-collapse supernova gravitational wave signals*, Journal of Astrophysics and Astronomy **43**, 5.
12. A. Mishra, A. K. Meena, A. More, S. Bose, and J. S. Bagla, 2021, *Gravitational lensing of gravitational waves: effect of microlens population in lensing galaxies*, MNRAS **508**, 4869-4886.
13. M. P. Rajvanshi, A. Singh, H. K. Jassal, and J. S. Bagla, 2021, *Tachyonic vs quintessence dark energy: linear perturbations and CMB data*, Classical and Quantum Gravity **38**, 195001.
14. A. K. Meena, A. Ghosh, J. S. Bagla, and L. L. R. Williams, 2021, *Exotic image formation in strong gravitational lensing by clusters of galaxies - II. Uncertainties*, MNRAS **506**, 1526-1539.
15. A. K. Meena and J. S. Bagla, 2021, *Exotic image formation in strong gravitational lensing by clusters of galaxies - I. Cross-section*, MNRAS **503**, 2097-2107.
16. M. P. Rajvanshi and J. S. Bagla, 2020, *Non-linear spherical collapse in tachyon models and a comparison of collapse in tachyon and quintessence models of dark energy*, Classical and Quantum Gravity **37**, 235008.
17. A. Singh, S. Mahajan, and J. S. Bagla, 2020, *Study of galaxies on large-scale filaments in simulations*, MNRAS **497**, 2265-2275.

18. J. Dutta, S. Sur, A. Stacy, and J. S. Bagla, 2020, *Modeling the Survival of Population III Stars to the Present Day*, ApJ **901**, 16.
19. A. K. Meena and J. S. Bagla, 2020, *Finding singularities in gravitational lensing*, MNRAS **492**, 3294-3305.
20. A. K. Meena and J. S. Bagla, 2020, *Gravitational lensing of gravitational waves: wave nature and prospects for detection*, MNRAS **492**, 1127-1134.
21. A. Singh, M. Gulati, and J. S. Bagla, 2019, *Ram pressure stripping: an analytical approach*, MNRAS **489**, 5582-5593.
22. M. P. Rajvanshi and J. S. Bagla, 2019, *Reconstruction of dynamical dark energy potentials: Quintessence, tachyon and interacting models*, Journal of Astrophysics and Astronomy **40**, 44.
23. A. Bera, N. Kanekar, J. N. Chengalur, and J. S. Bagla, 2019, *Atomic Hydrogen in Star-forming Galaxies at Intermediate Redshifts*, ApJL **882**, L7. (Topcite 50+)
24. S. Rana and J. S. Bagla, 2019, *Angular clustering of point sources at 150 MHz in the TGSS survey*, MNRAS **485**, 5891-5896.
25. S. Rana, T. Ghosh, J. S. Bagla, and P. Chingangbam, 2018, *Non-Gaussianity of diffuse Galactic synchrotron emission at 408 MHz*, MNRAS **481**, 970-980.
26. M. Pratap Rajvanshi and J. S. Bagla, 2018, *Nonlinear spherical perturbations in quintessence models of dark energy*, JCAP **2018**, 018.
27. B. K. Gehlot and J. S. Bagla, 2017, *Prospects of Detecting HI using Redshifted 21-cm Radiation at $z \sim 3$* , Journal of Astrophysics and Astronomy **38**, 13.
28. P. Singh, S. Rana, J. S. Bagla, and B. B. Nath, 2016, *Suppression of galactic outflows by cosmological infall and circumgalactic medium*, MNRAS **459**, 2-8.
29. S. Mitra, G. Kulkarni, J. S. Bagla, and J. K. Yadav, 2011, *Formation rates of dark matter haloes*, Bulletin of the Astronomical Society of India **39**, 563-591.
30. J. S. Bagla, N. Khandai, and K. K. Datta, 2010, *HI as a probe of the large-scale structure in the post-reionization universe*, MNRAS **407**, 567-580. (Topcite 100+)
31. H. K. Jassal, J. S. Bagla, and T. Padmanabhan, 2010, *Understanding the origin of CMB constraints on dark energy*, MNRAS **405**, 2639-2650. (Topcite 100+)
32. J. K. Yadav, J. S. Bagla, and N. Khandai, 2010, *Fractal dimension as a measure of the scale of homogeneity*, MNRAS **405**, 2009-2015. (Topcite 100+)
33. N. Khandai and J. S. Bagla, 2009, *A modified TreePM code*, Research in Astronomy and Astrophysics **9**, 861-873.
34. J. S. Bagla, G. Kulkarni, and T. Padmanabhan, 2009, *Metal enrichment and reionization constraints on early star formation*, MNRAS **397**, 971-978.
35. J. S. Bagla and N. Khandai, 2009, *The Adaptive TreePM: an adaptive resolution code for cosmological N-body simulations*, MNRAS **396**, 2211-2227.
36. J. S. Bagla, J. Prasad, and N. Khandai, 2009, *Effects of the size of cosmological N-body simulations on physical quantities - III. Skewness*, MNRAS **395**, 918-930.

37. J. S. Bagla and J. Prasad, 2009, *Gravitational collapse in an expanding background and the role of substructure - II. Excess power at small scales and its effect on collapse of structures at larger scales*, MNRAS **393**, 607-614.
38. J. S. Bagla, J. Yadav, and T. R. Seshadri, 2008, *Fractal dimensions of a weakly clustered distribution and the scale of homogeneity*, MNRAS **390**, 829-838.
39. J. S. Bagla and J. Prasad, 2006, *Effects of the size of cosmological N-body simulations on physical quantities - I. Mass function*, MNRAS **370**, 993-1002. (Topcite 50+)
40. H. K. Jassal, J. S. Bagla, and T. Padmanabhan, 2005, *Observational constraints on low redshift evolution of dark energy: How consistent are different observations?*, PhysRevD **72**, 103503. (Topcite 200+)
41. S. Ray, J. S. Bagla, and T. Padmanabhan 2005, *Gravitational collapse in an expanding universe: scaling relations for two-dimensional collapse revisited*, MNRAS **360**, 546-554.
42. J. S. Bagla, J. Prasad, and S. Ray, 2005, *Gravitational collapse in an expanding background and the role of substructure - I. Planar collapse*, MNRAS **360**, 194-202.
43. J. S. Bagla and S. Ray, 2005, *Comments on the size of the simulation box in cosmological N-body simulations*, MNRAS **358**, 1076-1082. (Topcite 50+)
44. J. S. Bagla, 2005, *Cosmological N-Body simulation: Techniques, Scope and Status*, Current Science **88**, 1088-1100. (Topcite 50+)
45. H. K. Jassal, J. S. Bagla, and T. Padmanabhan, 2005, *WMAP constraints on low redshift evolution of dark energy*, MNRAS **356**, L11-L16. (Topcite 400+)
46. J. S. Bagla and S. Ray, 2003, *Performance characteristics of TreePM codes*, New Astronomy **8**, 665-677. (Topcite 50+)
47. J. S. Bagla, H. K. Jassal, and T. Padmanabhan, 2003, *Cosmology with tachyon field as dark energy*, PhysRev D **67**, 063504. (Topcite 500+)
48. J. S. Bagla, 2002, *TreePM: A Code for Cosmological N-Body Simulations*, Journal of Astrophysics and Astronomy **23**, 185-196. (Topcite 200+)
49. J. D. Cohn, J. S. Bagla, and M. White, 2001, *A comparison of simulated and analytic major merger counts*, MNRAS **325**, 1053-1064.
50. M. J. Magliocchetti, J. S. Bagla, S. J. Maddox, and O. Lahav, 2000, *The observed evolution of galaxy clustering versus epoch-dependent biasing models*, MNRAS **314**, 546-556. (Topcite 50+)
51. J. S. Bagla, 1998, *Evolution of galaxy clustering*, MNRAS **299**, 417-424. (Topcite 50+)
52. J. S. Bagla, 1998, *Clustering of galaxies at high redshifts*, MNRAS **297**, 251-254. (Topcite 50+)
53. J. S. Bagla, S. Engineer, and T. Padmanabhan, 1998, *Scaling Relations for Gravitational Clustering in Two Dimensions*, ApJ **495**, 25-28.
54. R. A. M. J. Wijers, J. S. Bloom, J. S. Bagla, and P. Natarajan, 1998, *Gamma-ray bursts from stellar remnants: probing the Universe at high redshift*, MNRAS **294**, L13-L17. (Topcite 300+)
55. J. S. Bagla and T. Padmanabhan, 1997, *Cosmological N-body simulations*, Pramana **49**, 161. (Topcite 50+)

56. J. S. Bagla, B. Nath, and T. Padmanabhan, 1997, *Neutral hydrogen at high redshifts as a probe of structure formation - III. Radio maps from N-body simulations*, MNRAS **289**, 671-680.
57. J. S. Bagla and T. Padmanabhan, 1997, *Transfer of power in non-linear gravitational clustering*, MNRAS **286**, 1023-1031. (Topcite 50+)
58. J. S. Bagla and T. Padmanabhan, 1996, *A New Statistical Indicator to Study Nonlinear Gravitational Clustering and Structure Formation*, ApJ **469**, 470.
59. J. S. Bagla, T. Padmanabhan, and J. V. Narlikar, 1996, *Crisis in Cosmology: Observational Constraints on ω and H_0* , Comments on Astrophysics **18**, 275. (Topcite 100+)
60. J. S. Bagla and T. Padmanabhan, 1994, *Nonlinear Evolution of Density Perturbations Using the Approximate Constancy of the Gravitational Potential*, MNRAS **266**, 227. (Topcite 100+)

Books Edited

1. *Gravity and the Quantum: Pedagogical Essays on Cosmology, Astrophysics, and Quantum Gravity*, Fundamental Theories of Physics **187**, 2017, Eds. J S Bagla and Sunu Engineer, Springer International Publishing

Miscellaneous Articles

1. J. S. Bagla 2022, Resonance **27**, 1835, *Cecilia Payne-Gaposchkin*
2. J. S. Bagla 2021, Current Science **121**, 1367, *Obituary: Professor T Padmanabhan*
3. J. S. Bagla 2020, Resonance **25**, 1659, *Compact objects and black holes: 2020 Nobel prize in Physics.*
4. Manvendra Pratap Rajvanshi, Tuneer Chakraborty and J. S. Bagla, 2019, Resonance **24**, 977, *Gravitational collapse and structure formation in an expanding universe with dark energy.*
5. J. S. Bagla and Pritpal Sandhu 2015, Resonance **20**, 803: *Gravitational collapse and structure formation in an expanding universe.*
6. J. S. Bagla 2009, Resonance **14**, 216: *Hubble, Hubble's law and the expanding universe.*
7. J. S. Bagla 2004, Resource Summary, Khagol **59**, 5: *Cluster computing in Astronomy.*
8. J. S. Bagla 2001, Resource Summary, Khagol **48**, 5: *Cosmological N-Body Simulations.*

Mentoring of Post-Doctoral Fellows

I have mentored many post-doctoral fellows.

1. **Dr. Jaswant Yadav** was a post-doctoral fellow at the Harish-Chandra Research Institute during 2009. He worked on use of fractal dimensions for measuring the scale of homogeneity. He also contributed to the development of a semi-analytic galaxy formation code. He is now working as an assistant professor at Central University Haryana.
2. **Dr. Smriti Mahajan** was a DST fast track fellow starting April 2014 for a period of two years. She is now an INSPIRE faculty fellow at IISER Mohali. She is an observer and has been working independently on her research projects.

3. **Dr. Mamta Gulati** was a post-doctoral fellow with me for two years starting July 2014. She was awarded the SERB NPDF which she joined in June 2016. She moved to Thapar University as an assistant professor in July 2017. Dr. Mamta Gulati worked on galactic dynamics during her stay. She started work on a project related to the effect of RAM pressure stripping on star formation in galaxies that are falling into clusters and groups of galaxies.
4. **Dr. Jayanta Dutta** joined as a post-doctoral fellow in July 2016. He was awarded SERB NPDF in 2017. He worked on problems related to early star formation and the evolution of early stars, and possibility of their survival to the present day. He is now working as a visiting scientist at the Harish-Chandra Research Institute, Allahabad.
5. **Dr. Dipanweeta Bhattacharyya** joined as a post-doctoral fellow in February 2021 and worked at IISER Mohali for two years. Her expertise is in the area of super massive black holes. We collaborated on a study of the fate of black holes that form via mergers and may receive a kick in the merger process. We focused on globular clusters as sites of these mergers as the likely scenario. A manuscript based on this work is in review.

Supervision of Doctoral Research

The list of PhD students who are, or who have worked with me is given below in chronological order.

1. **Chavan Mohan Shende.** Chavan has joined me in August 2023 and we are in the process of defining a problem. He is interested in structure of halos and its relation with properties of dark matter.
2. **Sauraj Bharti.** He started research work in January 2021. He is working on estimates for detection of HI in galaxies at present.
3. **Swati Gavas.** She started research work in August 2019. She is working on cosmological N-Body simulations to study statistics of collapsed structures. She has demonstrated that the mass function of collapsed halos is not universal.
4. **Ashish Kumar Meena.** He started research work in Jan.2017. He is studying aspects of strong gravitational lensing. He is also studying the limitations of geometric optics in the case of lensing of gravitational waves. He has defended his thesis and will move to Ben-Gurion University for a post-doctoral stint in September 2021. He has been jointly awarded the *V V Narlikar best thesis prize* of the Indian Association for General Relativity and Gravitation (IAGRG) in 2022.
5. **Manvendra Pratap Rajvanshi.** He started research work in 2016. He is studying non-linear collapse in dynamical dark energy models. His focus is in exact, relativistic calculation for systems with spherical symmetry. He has defended his thesis and joined Ahmedabad University for a post-doctoral stint. At present he is a post-doctoral fellow at KAUST in the numerical mathematics group.
6. **Ankit Singh.** He started research work in 2015. He is working on aspects of galaxy formation. He is collaborating with Dr. Mamta Gulati to study the effect of galaxy interactions on star formation. He is also working with Dr. Smriti Mahajan to quantify environment dependence using observations and simulations. He successfully defended his thesis in June 2020. He joined KIAS in November 2020 as a post-doctoral fellow.
7. **Sandeep Rana.** He started research work in 2014. He worked on studies of foregrounds for HI detection via redshifted 21 cm line signal from high redshifts. He defended his thesis in 2019. He worked as a post-doctoral fellow at NISER Bhubaneswar. At present he is working with ARP investments.

8. **Girish Kulkarni.** He started research work in 2007. He has done work on modelling cosmological reionization and galaxy formation. He has also worked on aspects of mass function of collapsed haloes. He was a Nehru-Fulbright pre-doctoral fellow at the Harvard-Smithsonian Center for Astrophysics from August 2010 – April 2011. He submitted his thesis in August 2011 and was awarded the degree in the same year. Girish joined the Max-Planck Institute for Astronomy, Heidelberg, Germany as a post-doctoral fellow in 2011 and moved to Institute of Astronomy, Cambridge in 2014. He joined DTP, TIFR Mumbai as a faculty member in 2018.
9. **Nishikanta Khandai.** He started research work in 2005. He has done work on optimising the N-Body codes and improving these further. He is using the N-Body simulations to study aspects of galaxy formation at high redshifts. He submitted his in August 2009 and joined the Carnegie Mellon university as a Petascale fellow soon after. He was awarded the degree in July 2010. He later worked as a post-doctoral fellow in Brookhaven lab, USA. He joined NISER, Bhubaneswar as a faculty member in Aug.2014. At present he is an associate professor at NISER Bhubaneswar.
10. **Jayanti Prasad.** He started research work in early 2003. He has studied aspects of mode coupling in non-linear evolution of density perturbations with a special focus on the role of sub-structure. He also worked done work on quantifying limitations of N-Body simulations arising from the finite range of scales resolved in initial conditions. He submitted his thesis in April 2008 and moved to a post-doctoral position at the National Centre for Radio Astrophysics, Pune. He was awarded the PhD in 2009. He worked on gravitational waves and was with LIGO India at the Inter-University Centre for Astronomy and Astrophysics, Pune. He was part of the discovery papers and shared the breakthrough award. At present he is working with Acellere as a data scientist.
11. **Suryadeep Ray.** He worked on problems relating to gravitational clustering. He improved and optimised the TreePM method for doing cosmological simulations. He used these methods to study scaling relations and clustering in the non-linear regime. He was awarded the PhD in 2006. At present Suryadeep is working with CGG Ltd. as an expert on high performance scientific computing.

Supervision of Research by BS-MS students

I have supervised many MS thesis projects by students. A list in chronological order is given here:

1. **James Watt** (Aug.2023 – April 2024) James is working primarily with Tarun Souradeep at RRI Bangalore. He is working on *Reconstructing the Inflaton Potential from the CMB Anisotropies*.
2. **Prajakta Mane** (Aug.2023 – April 2024) Prajakta is working primarily with Surhud More and Anupreeta More at IUCAA Pune. The theme of her work is *Strategies to identify strongly lensed type Ia supernovae in Rubin LSST*.
3. **Shiv Shankar Singh** (Aug.2022 – April 2023) Shiv worked on N-Body simulations to study the fate of black holes that may form due to mergers in globular clusters as these may receive a kick in the merger process.
4. **Simranjeet Kaur** (Aug.2022 – April 2023) Simran set up a horn antenna to detect 21cm signal from the Galaxy and used this to obtain rotation curve of the Galaxy.
5. **Komal Bali** (Aug.2022 – April 2023) Komal worked primarily with Dr. Joe Ninan (TIFR Mumbai) on exo-planet detection and characterization of noise arising from scattered Moonlight. She has joined ETH Zurich for her PhD in Dec.2023.

6. **Pravita Hallur** (Aug.2022 – April 2023) Pravita worked primarily with Dr. Lia Maderos (IAS, Princeton) on using simulations to characterize the power spectrum for EHT observations of accretion disks in the vicinity of super massive black holes. She joined CU Boulder for her PhD.
7. **Devang Liya** (Aug.2021 – April 2022) Devang worked on the excursion set theory of mass functions to understand the dependence of the interaction of scales on the shape of the power spectrum. He has joined Newcastle for PhD.
8. **Mr. Satyapan Munshi** (Aug.2020 – April 2021) Satyapan worked on HI intensity mapping. He used the tapered grid estimator to analyze observations of the extended Groth strip (EGS) made using the upgraded GMRT (uGMRT). He joined Kaptyan Astronomical Institute for his PhD in 2021.
9. **Mr. Rahul Ramesh** (Aug.2020 – April 2021) Rahul is studying gravitational lensing of gravitational waves. The specific problem of interest is lensing in the regime where wave effects becomes important. He studied the effect of lensing on compact wave packets of gravitational waves. His MS thesis work has been published in two articles. He joined ITA Heidelberg for his PhD in 2021.
10. **Mr. Dhruv Pandya** (Aug.2020 – April 2021) Dhruv worked on cyclotron MASER emission from binary stars. This work was done jointly with Professor Kulinder Pal Singh. Dhruv joined IUCAA, Pune for his PhD in 2021 but decided to move to industry.
11. **Mr. Pranav Kukreti** (Aug.2017 – April 2018) Pranav has used data from the uGMRT to study evolution of star formation in the universe. He joined Groningen for PhD in 2019.
12. **Ms. Suhani Gupta** (Aug.2017 – April 2018) Suhani studied the variation of tidal forces and their impact on mass function of collapsed halos. She is doing PhD from Centre for Theoretical Physics, Polish Academy of Natural Sciences.
13. **Ms. Haritha R.** (Aug.2016 – April 2017) Haritha studied the variation of tidal forces and their impact on mass function of collapsed halos. She joined University of Hamburg for a PhD in January 2018.
14. **Ms. Prashansa Gupta.** (Aug. 2015 - April 2016) Prashansa studied approaches to wide field imaging in radio astronomy. She is working in data sciences.
15. **Mr. Manvendra Pratap Rajwanshi.** (Aug. 2015 - April 2016) Manvendra studied non-linear gravitational collapse in presence of dark energy. He continued his work in PhD at IISER Mohali.
16. **Ms. Soniya Sharma.** (Aug. 2013 - Apr. 2014) Soniya has done a project on higher order singularities in strong gravitational lensing. She has completed PhD from Australian National University and is presently working for the Intel Corporation.
17. **Mr. Bharat Gehlot.** (Aug. 2013 - Apr. 2014) Bharat has done a project on prospects for detection of neutral Hydrogen at high redshifts using the upgraded Ooty radio telescope. He has completed PhD from Groningen and is presently doing his second post-doctoral research at Groningen after a stint at Arizona.
18. **Ms. Anshu Gupta.** (Aug. 2012 - Apr. 2013) Anshu did a project on collisional coupling of the hyperfine transition of $^3\text{He}^+$ with the view of estimating efficiency of using this transition for cosmological applications. She has completed her PhD from Australian National University in observational astronomy and is now doing post-doctoral research.
19. **Mr. Gagan Preet Singh.** (Aug. 2012 - Apr. 2013) Gagan did a project on the effect of tidal disruption and RAM pressure stripping on star formation in satellite galaxies. He is working as a data scientist at HP.

20. **Mr. Mohit Tanga.** (Aug. 2011 - Apr. 2012) Mohit did a project on models of galaxy formation. This is a project that spans two semesters. He joined Max-Planck Institute for Extraterrestrial physics, Garching for a PhD on Gamma Ray Bursts.

Teaching Experience

Table 1: List of courses taught at IISER Mohali. These are the full courses taught by me at IISER Mohali. I have also assisted in running of many other courses as a co-instructor, tutor, etc.

Course Code	Course Name	Credits	Semester when taught
PHY111	Physics Lab I	1	Aug-Nov 2017 & Aug-Nov 2018
IDC101	Introduction to Computing	2	Aug-Nov 2011 & Aug-Nov 2012
IDC201	Introduction to Astronomy	2	Aug-Nov 2010 & Aug-Nov 2011 Aug-Nov 2012 & Aug-Nov 2015 Aug-Nov 2016 & Jan-Apr 2018 Jan-Apr 2024
PHY202	Thermodynamics	3	Jan-Apr 2013 & Jan-Apr 2014
PHY301	Classical Mechanics	4	Sep-Dec 2021 Aug.-Dec. 2022
PHY303	Classical Electrodynamics	4	Aug-Nov 2010 & Aug-Nov 2013 Aug-Nov 2014
PHY422	Computational Physics I	4	Jan-Apr 2012 & Jan-Apr 2015 Jan-Apr 2020
PHY425	Computational Physics II	4	Jan-Apr 2019
PHY601	Review of Classical Mechanics	4	Aug-Nov 2020
PHY635	Gravitation and Cosmology	4	Jan-Apr 2011, Aug-Dec 2023
PHY637	Astrophysics I: Astrophysical processes and stars	4	Jan-Apr 2021, 2022, 2023
PHY638	Physics of Fluids	4	Jan-Apr 2017, Aug-Nov 2019 & Jan-Apr 2021
PHY654	Cosmology and Galaxy Formation	4	Jan-Apr 2014 & Jan-Apr 2016 Jan-Apr 2018

Table 2: List of courses taught at HRI, Allahabad. All courses were equivalent to a 4 credit course.

Course	Semester when taught
Atomic, Molecular and Nuclear Physics	Jan-Apr 2009
Mathematical Methods II	Jan-Apr 2008
Introduction to Astronomy and Astrophysics	Aug-Dec 2002, 2003, 2007
Quantum Mechanics	Aug-Dec 2005
Cosmology	Jan-May 2005
Classical Electrodynamics	Aug-Dec 2004
Classical Mechanics	Aug-Dec 2001

Astronomy Research at IISER Mohali

I was the first person to be hired at IISER Mohali with research interests in astronomy and astrophysics. We had a slow start as the institute was new and hiring of faculty as well as PhD students was not fast paced. Over the last thirteen years, we have grown to a group with four regular faculty members and three visiting faculty members. Ten PhD students have graduated and nearly eight PhD students and a post-doctoral fellow are part of the group at present. We have hosted seven post-doctoral fellows who have moved on to other positions since: four of these are in regular positions. More than 50 students have done their MS thesis with members of the group in this time.

The group has a strong publication record, especially in the last five years.

We have a suite of courses on different aspects of astronomy and astrophysics, and we offer a minor in astronomy to the students in the BS-MS dual degree program. In the last three years, 18 students have completed this minor out of almost 170 students who majored in physics. Of these, close to 60 students have taken multiple courses in astronomy during their tenure even though they have not opted for the minor.

I have taken the lead in designing courses on computational physics and astrophysics, apart from regular physics courses at the institute.

We have had regular weekly meetings, discussions and presentations within the group for more than ten years. We have also hosted a number of visitors and organized many workshops and conferences. This has enabled our students to develop a broader perspective.

I have also mentored the astronomy club at the institute. A large number of undergraduates are interested in astronomy even if they do not go on to work in this area. With their help, we have organized a large number of sky watching sessions and outreach programs for students in the region. These programs cover lay citizens, school students, college students, orphanages, etc. The astronomy club has also developed a set of about ten demonstrations and daytime astronomy modules and they have been doing programs in schools in the region.

The astronomy group at IISER Mohali is well represented within the Indian astronomy community as well as the overall scientific community. Three of the faculty are members of the IAU. I expect that we will be able to grow and make stronger impact during the next decade.

Science Outreach

I have been involved in science popularisation and outreach related activities for a long time. In most activities, my role has been restricted to giving popular lectures at planetaria or in clubs and schools, and organizing sky watch sessions. In the last four years I have averaged around one session (lectures and sky watch sessions) each month. Many of these sessions are conducted in regional languages.

I have also been a part of the working group for inclusive outreach in astronomy where we are compiling resources to reach out to people with disabilities.

Administrative Experience

1. I served as Dean Academics at IISER Mohali during March 13, 2020 to June 27, 2023.
2. I am a member of the Academic Senate of IISER Mohali since 2010.
3. I served as the Head of the Department of Physical Sciences at IISER Mohali during Aug.1, 2015 to June 30, 2018.
4. I served as the Professor Incharge, Computer Centre at IISER Mohali during Jan.1, 2014 to Dec.31, 2017.
5. I served as the Senate nominee on the Board of Governors of IISER Mohali during Jan.1, 2015 to Dec.31, 2016.
6. I served as the Dean (Research and Development) at IISER Mohali during Jan.1, 2011 to Dec.31, 2013.

I have served on a number of committees at HRI Allahabad and also at IISER Mohali. Some of these are listed below.

1. Member of the committee against sexual harassment of women at IISER Mohali during 2012–2013.
2. Member (Jan.2011 – Dec.2019) and convener (Jan.2014 – Dec.2017) of the computer purchase committee.
3. Member (July 2003 – April 2010) and then Convener (July 2006 – April 2010) of the post-doctoral and visitor programs for physics at HRI.
4. Member of the Rajbhasha committee (July 2003 – April 2010) at HRI.
5. Member (Dec.1999 – April 2010) and then Convener (May 2002 – April 2010) of the telescope committee at HRI.
6. Member of the computer Committee at HRI (April – Oct.2000, May 2002 – July 2003).
7. Member of the library Committee at HRI (April 2001 – March 2002).

Organisational Experience

Schools, Workshops and Conferences

1. *Shivalik HEPCATS* held at IISER Mohali on Dec.7, 2019. This is a regional meeting of people working in *High Energy Physics, Cosmology, Astronomy: Theory and Simulations*. This was the first meeting and I have co-organized several meetings in this series.
2. *ICGC-2019* held at IISER Mohali during December 10-13, 2019. (LOC member).
3. *COSPAR capacity building workshop on broad band spectral and timing studies with Astrosat, Chandra and XMM-Newton observatories* held at IISER Mohali during March 9–20, 2019. (Convener, LOC and member SOC).
4. *Vigyan Pratibha workshop for school teachers* held at IISER Mohali during December 18 – 19, 2019. (Convener, LOC)

5. *International Conference on Gravitation and Cosmology* held at IISER Mohali during Dec.14–18, 2015. (Convener, LOC and Co-chair, SOC).
6. Organiser of the *Telescope making workshop* held at IISER Mohali in Dec.2014.
7. Annual meeting of the *Astronomical Society of India* held at IISER Mohali during March 19–22, 2014. (Convener LOC).
8. Co-organiser of the *Nurture Camp* for Astronomy held at IISER Mohali during Dec.10-21, 2012.
9. Co-organiser of the ASI symposium on *Cosmology and Galaxy Formation* held at IISER Mohali during Nov.5–7, 2011.
10. Co-organiser of a *SERC school on Astronomy and Astrophysics* held at NCRA-TIFR during June 14 – July 10, 2010.
11. Organiser of an international conference on *Cosmological Reionisation* held at HRI Allahabad during Feb.2009.
12. Co-organiser of a discussion meeting on *Reionization and the Inter-Galactic Medium* held at the Orange County Resorts, Coorg in Dec.2008.
13. Organiser of *I organised the Indian Conference on Cosmology and Galaxy Formation* held at HRI during Nov. 2007.
14. Co-organiser of *the school on Parallel Computation and Clusters* held in IMSc, Chennai during Jan.2005.
15. Co-organiser of a *summer school on Gravitation and Cosmology* held at HRI in May 2004.
16. Organiser for an advanced school on *Physics of galaxy formation* held at HRI in Dec.2003.
17. Organiser for a school on *distributed parallel computing for physicists* held at HRI in April 2002.

Seminars, Colloquia, etc.

1. Colloquium coordinator at IISER Mohali during Oct.2010 – Dec.2014.
2. Colloquium coordinator at HRI during July 2003 – April 2010.
3. Steve Maddox and I were in charge of (Oct.1997 - Sep.1998) organising Cosmology seminars at IOA. We also initiated the Joint Cosmology seminars (DAMTP, IOA and MRAO) along with our counterparts from DAMTP and MRAO.
4. I was in charge of organising a series of after dinner talks named PEP (Perceptions of Evolving Physics) talks from 1993 to 1996 at IUCAA.