<u>Curriculum Vitae</u>

Name in full:	Jais Kumar
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Designation: Assistant Professor

Personal Details: Date of Birth - 10th January, 1994 Nationality - Indian Gender - Male



Contact Details:Department of PhysicsKashi Naresh Govt. Post Graduate College, GyanpurSant Ravidas Nagar (Bhadohi), Uttar Pradesh, India – 221304Email - jkpatel94@gmail.comMobile - +91 9473871025ORCID Id:https://orcid.org/0000-0002-8916-6941

Education

- **Doctorate of Philosophy** in Radio Astronomy and Astrophysics, *Pursuing* Department of Physics, Indian Institute of Technologyv(BHU) Varanasi, Varanasi, Uttar Pradesh, India.
- Master of Science in Physics (2014 2016), *CGPA 8.15/10* Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India.
- **Bachelor of Science** in Physics, Chemistry and Mathematics (2011 2014), *Marks* 65% Ewing Christian College, Allahabad, Uttar Pradesh, India (University of Allahabad).
- **Higher Secondary Examination** [Class *XII*] (2008 2010), *Marks* 67.6% Standard Inter College, Mauaima, Allahabad, Uttar Pradesh, India, (U. P. Board).
- Secondary Examination [Class X] (2008), *Marks 68%* Arvind Ghosh Higher Secondary School, Sakramau, Harisenganj, Allahabad, Uttar Pradesh, India, (U. P. Board).

Research Experience

- Doctoral Thesis (2021)
 Coming soon.....
 Under the supervision of *Dr. Prasun Dutta* Department of Physics, Indian Institute of Technology (BHU) Varanasi
 Varanasi, Uttar Pradesh, India.
- Master's Thesis (2016)
 Fast Radio Bursts A Mysterious Transient Events
 Under the supervision of *Prof. Somnath Bharadwaj and Dr. Nirupam Roy* Department of Physics, Indian Institute of Technology Kharagpur
 Kharagpur, West Bengal, India.

Fellowship & Awards

- Junior Research Fellow 2016 2018 (University Grant Commission).
- Senior Research Fellow 2018 2021 (University Grant Commission).

National Level Examinations

- All India Engineering / Architecture Entrance Examination (AIEEE 2011).
- National Graduate Physics Examination (NGPE 2012).
- Joint Admission Test for M.Sc. (JAM 2014).
- CSIR-UGC NET qualified for Junior Research Fellow (December 2014).
- CSIR-UGC NET qualified for Junior Research Fellow (June 2015).
- Graduate Aptitude Test (GATE 2016).

Schools, Workshops & Conferences

- 5th Topical Conference on Gravity, Cosmology, Astronomy and Astrophysics Eastern region (TCGCA-ER), ISI Kolkata, 2016.
- Workshop on the Epoch of Reionization and 21- cm Cosmology, NCRA TIFR, Pune, 2017.
- Radio Astronomy School (RAS 2017), NCRA TIFR, Pune, 2017.
- A conference titled "Universe After the First 200 Million Years: Cosmic Dawn, Reionization and Post-reionization using 21- cm" at Presidency University, Kolkata, 2017.
- Astronomical Society of India meet (ASI 2018), Osmania University Hyderabad, 2018.

- The Franco-Indian school on 'From reionization to large scale structure a multiwavelength approach', organized by IUCAA Pune, 2018.
- A conference titled "Recent Developments in Cosmology" at Banaras Hindu University, Varanasi, 2018.
- School on 21- cm Cosmology titled "Frontiers in 21- cm Cosmology", KSO Kodaikanal, organized by IIA & SKA-India, 2018.
- Workshop on 21- cm Cosmology titled "Frontiers in 21- cm Cosmology", KSO, Kodaikanal, organized by IIA & SKA India, 2018.
- International School on Cosmolgy titled "Cosmology The Next Decades", ICTS Banglore, 2019.
- "The Metrewavelength Sky II", International conference to celebrate the 90th year of Govind Swarup and the 1st year of the upgraded GMRT, organized by NCRA TIFR, Pune, India, 2019.
- Visiting Research Student, (from 8th 30th June, 2019), The Discipline of Astronomy, Astrophysics and Space Engineering (DAASE) IIT Indore, India, 2019.
- One Week Workshop on supercomputing, Organized under National Super-computing Mission (HRD Group), at IIT (BHU), Varanasi, India, 2019.
- International Conference and School on Observing The First Billion Years of the Universe Using Next Generation Telescopes, DAASE, IIT Indore, India, 2020.
- 2020 URSI Regional Conference on Radio Science (URSI-RCRS 2020), IIT (BHU) Varanasi, India, 2020.
- 3rd Global 21- cm Workshop, Cambridge, UK, 19th-22nd October 2020 (online).
- Virtual SKA 2021 science conference "A precursor view of the SKA sky", organized by SKA Consortium, 15-19 March 2021.
- "Workshop & School on 21- cm Cosmology & Reionization", Organized by SKA India CD/EoR & Cosmology Science Working Group, Host: Indian Institute of Science, Bengaluru, India, April 19-21, 2021 (Online).

Talks and Presentations

- Poster presentation titled 'Polarization Calibration and its need in radio Astronomy'. In Astronomical Society of India meet (ASI 2018) Hyderabad, India, 2018.
- Oral Presentation titled "Instrumental Calibration Requirements for EoR Observations" in the Workshop "Frontiers in 21- cm Cosmology", KSO, Kodaikanal, (IIA & SKA India), 2018.
- Informal talk titled "Instrumental Calibration Requirements for EoR Observations" in the International School on Cosmolgy "Cosmology- The Next Decades", ICTS Banglore, India, 2019.
- Seminar/Discussion of the work titled "Instrumental Calibration Requirements for EoR observations" in the SKA India CD/EoR & Cosmology Group (Teleconference), May-9, 2019.

- Poster presentation titled "Instrumental Calibration Requirements for observation of Redshifted 21-cm signal from neutral hydrogen" in International conference "The Metrewavelength Sky II", at NCRA TIFR, Pune, India, 2019.
- Oral Presentation titled "Instrumental Calibration Requirements for EoR Observations" in the International Conference and School on Observing The First Billion Years of the Universe Using Next Generation Telescopes, DAASE, IIT Indore, India, 2020.
- Oral Presentation titled "Instrumental Calibration Requirements for EoR Observations" in the 2020 URSI Regional Conference on Radio Science (URSI- RCRS 2020), IIT (BHU) Varanasi, India.
- Poster presentation titled "Calibration Requirements for EoR observations Effect of timecorrelated gains" in one day conference titled "The 21-cm Signal from Cosmic Dawn and the Epoch of Reionisation", in SAZERAC (originally the Summer All Zoom Epoch of Reionisaton Astronomy Conference) organised on Jan- 29, 2021 (online).
- Seminar/Discussion of the work titled "Calibration Requirements for Epoch of Reionization 21cm signal observations" in the SKA India CD/EoR & Cosmology Group (Teleconference), Nov- 27, 2021.
- Poster presentation titled "Calibration Requirements for EoR observations Effect of time correlated gains" in SKA 2021 science conference "A precursor view of the SKA sky", 15-19 March 2021.
- Oral presentation in Splinter session titled "Calibration Requirements for EoR observations Effect of time correlated gains" in SKA 2021 science conference "A precursor view of the SKA sky", March- 17, 2021.
- Oral presentation titled "Calibration Requirements for EoR observations Effect of time correlated gains" in "Workshop & School on 21-cm Cosmology & Reionization", April 21, 2021 (Online).

Publications

- Jais Kumar, Prasun Dutta, Nirupam Roy, "Calibration requirements for epoch of reionization 21-cm signal observations I. Effect of time-correlated gains", Monthly Notices of the Royal Astronomical Society, Volume 495, Issue 4, July 2020, Pages 3683–3694, https://doi.org/10.1093/mnras/staa1371
- J. Kumar, P. Dutta, S. Das and N. Roy, "Instrumental Calibration for Observations of Redshifted 21-cm Signal from Neutral Hydrogen," 2020 URSI Regional Conference on Radio Science (URSI-RCRS), Varanasi, India, 2020, pp. 1-3, doi: 10.23919/URSIRCRS49211.2020.9113590 Electronic ISBN: 978-908-25987-8-0 Print on Demand(PoD) ISBN: 978-1-7281-5571-5
- Pavan Kumar Vishwakarma, **Jais Kumar**, "*Trans-Alfvenic Magnetohydrodynamic Turbulence in the Vicinity of Supernova Remnant Cassiopeia-A Shocks*", *Monthly Notices of the Royal Astronomical Society*, Volume 498, Issue 1, October 2020, Pages 1093-1100, https://doi.org/10.1093/mnras/staa2293

• **Kumar et al. 2021**, "Calibration Requirements for EoR observations - II, Mathematical formalism for the power spectrum bias and variance in presence of gain error", *submitted* for publication in *Monthly Notices of the Royal Astronomical Society*.

Current Area of Research

My broad area of research includes the *Cosmic Dawn, Epoch of Reionization and 21- cm cosmology*. We use the redshifted 21- cm signal from neutral hydrogen to probe the early universe, where we try to understand the various fundamental issues related to the phase transition (from neutral to ionized) of the Universe. Currently I am pursuing my Ph. D. in the field of **Reionization Cosmology** under the supervision of **Dr. Prasun Dutta** at *IIT (BHU) Varanasi*.

My current research work is focused on the challenges in the observation of redshifted 21- cm signal where I am studying the time and frequency dependent gain-calibration effects in the power spectrum measurements of H_I 21 cm signal from the Epoch of Reionization. This also includes development of the power spectrum estimators and new calibration algorithms to mitigate these systematic effects.

My interests also extends towards exploring the synergies between the 21- cm signal and the other cosmological/astrophysical probes such as the *Cosmic Microwave Background Radiation* and the *Ly-* α *emitters*. Last but not the least, I am also interested in the use of *machine learning algorithms and high performing supercomputers* in astronomy.

Technical Skills

- **Operating Systems:** UNIX (Ubuntu and CentOS), Windows (7/8/10).
- **Programming Languages:** C, PYTHON, and MATLAB.
- **Text Processing:** LaTex, Libre Office, MS Office.
- **Graphical tools:** GNUPlot, Matplotlib, MATLAB GUI, DS9.