

Abhishek Johri



PRESENT OFFICE

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ACADEMIC APPOINTMENTS

- Jan-2024– **Assistant Professor**, *Department of Physics*, D. B. S. College, Kanpur, U.P-India.
Till date
- Jan-2022– **Lecturer Physics**, *D. A. V. Inter College*, Belthara Road, Ballia U.P-India.
Jan-2024
- Dec-2020– **Temporary Faculty**, *Department of Physics*, NIT Raipur, Raipur, Chhattisgarh-India.
Jan-2022
- Aug-2018– **Assistant Professor Physics**, *Center for Basic Sciences*, Pt. Ravishankar Shukla
Apr-2020 University, Raipur, Chhattisgarh-India.

EDUCATION

- 2010–2018 **Ph.D. in Physics (Specialization in Solar physics)**, *Tata Institute of Fundamental Research (TIFR)*, Mumbai, Maharashtra-India.
- 2008–2010 **M.Sc. Physics (Specialization in Astrophysics)**, *Pandit Ravishankar Shukla University*, Raipur, Chhattisgarh-India.
- 2019–2021 **M.Sc. Mathematics**, *Pandit Sundarlal Sharma (Open) University*, Bilaspur, Chhattisgarh-India.
- 2004–2007 **B.Sc. (Honours in Physics)**, *Banaras Hindu University*, Varanasi, Uttar Pradesh-India.

AWARDS & HONOUR

- 2010 CSIR-UGC (India) National Eligibility Test (2009) : Qualified for Junior Research Fellowship and Lectureship
- 2010 1st Rank and Gold medal in the Master of Science degree at Pandit Ravishankar Shukla University, Raipur

DOCTORAL THESIS

Title **Acceleration and Evolution of Solar Energetic Particle Events in the Sun-Earth Distance.**

Supervisor **Professor P. K. Manoharan**, *Radio Astronomy Centre (RAC), National Centre for Radio Astrophysics (NCRA), Tata Institute of Fundamental Research (TIFR), Ooty, Tamilnadu-India.*

Description This thesis presents the study of propagation of coronal mass ejections (CMEs) in the Sun-Earth distance and associated kinematics of CMEs with the time (as well as distance) evolution of solar energetic particle (SEP) events from their onset near the Sun to the crossing time at the magnetosphere of the earth. This thesis work covers a study of large number of solar events, which occurred over a period of ~ 3 solar cycles.

Status Degree awarded on August 31, 2018

RESEARCH INTERESTS

- CME Initiation and Propagation
- CME-CME Interaction
- Solar Energetic Particle Events and Space Weather
- Data Analysis Automation for large volume of data

PROPOSED ROADMAP FOR TEACHING AND RESEARCH

The next few years will be crucial both from the point of view of teaching as well as my research. My road map will be a combination of teaching and research. I believe that excellence in teaching and research are mutually inclusive. Because they require similar skills, improvement and advancement in one feeds back into improvement and advancement in the other. I will use current research perspectives, paradigms, and debates in the classroom to show that knowledge is contested and growing rather than accepted fact. I would also let students into my research community.

VISION FOR THE DEPARTMENT

I would like to establish the department as a center of radio astronomy. With this the department will evolve as the first radio astronomy center. During my doctoral study, I have developed expertise in taking astronomical observations using the Giant Metrewave Radio Telescope (GMRT: one of the most powerful telescopes in the world) at Pune, Maharashtra and the Ooty Radio Telescope (ORT) at Ooty, Tamilnadu. Both GMRT and ORT are run by National Centre for Radio Astrophysics of Tata Institute of Fundamental Research, Pune. The execution at the department will involve setting up small and affordable radio telescope for the continuous monitoring of the Sun. This will be interesting enough for the students, to observe the Sun at radio wavelength, at UG/PG level. No doubt, this establishment will be a milestone and provide recognition to the department.

PUBLICATIONS

1. Intense Solar Energetic Particle Events: Acceleration Associated with Shocks Driven by Coronal Mass Ejections
Johri, A. and Manoharan, P. K. 2022 **In-preparation**
2. Intense Flare-CME Event of the Year 2015: Propagation and Interaction Effects between Sun and Earth's Orbit
Johri, A. and Manoharan, P. K. 2016, *Solar Phys.*, **291**, 1433. ADS. DOI.

3. Interplanetary Consequences of Coronal Mass Ejection Events occurred during 18–25 June 2015
Manoharan, P. K. and Maia, D. and **Johri, A.** and Induja, M. S. 2016, Coimbra Solar Physics Meeting: Ground-based Solar Observations in the Space Instrumentation Era, **504**, 59. ADS.
4. Current State of Reduced Solar Activity: Intense Geomagnetic Storms.
P.K. Manoharan, K. Mahalakshmi, **A. Johri**, B.V. Jackson, D. Ravikumar, K. Kalyanasundaram, S.P. Subramanian, A. K. Mittal. 2018, *Sun and Geosphere*, **13**, 135. ADS. DOI.
5. Exploring the common origins of the Forbush decrease phenomenon caused by the interplanetary counterpart of coronal mass ejections or corotating interaction regions
Anil Raghav, Zubair Shaikh, Disha Misal, Gopika Rajan, Wageesh Mishra, S. Kasthurirangan, Ankush Bhaskar, Nitinkumar Bijewar, **Abhishek Johri**, and Geeta Vichare. 2020 *Physical Rev. D*, **101**, issue 6. ADS. DOI.
6. Imaging radio recombination line emission from galactic star forming regions using GMRT (2 pages).
Johri, A., Kantharia, N. G., & Roshi, A. D. 2014, Astronomical Society of India Conference Series, **13**, 281. ADS.

ORAL PRESENTATIONS

1. **Acceleration and Evolution of Solar Energetic Particle Events in the Sun-Earth Distance**, 35th Meeting of the Astronomical Society of India, Jaipur, India, 2017.
2. **Studying Bandpass Stability at GMRT using Radio Recombination Lines Observations**, Regional Conference on Radio Science, Pune, India, 2014.

POSTER PRESENTATIONS

1. **Imaging Radio Recombination Line emission from Galactic star forming complexes**, 32nd Meeting of the Astronomical Society of India, Mohali, India 2014.
2. **Radio Recombination Line emission from Galactic star forming regions**, 33rd Meeting of the Astronomical Society of India, Pune, India 2015.
3. **Imaging Radio Recombination Line emission from Galactic star forming complexes with the GMRT Software Back-end (GSB)**, METREWAVELENGTH SKY, NCRA, Pune, India, 2013.

CONFERENCE & WORKSHOPS

- Mar–2017 Attended and given an oral presentation in the 35th meeting of the Astronomical Society of India, Jaipur, India
- Nov–2016 Attended SCOSTEP/ISWI International School on Space Science, Sangli, India
- June–2016 Attended a national workshop on Science with the uGMRT, Pune, India
- Jan–2016 Attended international conference on Science for Space Weather, Goa, India
- Feb–2015 Attended and presented a poster in the 33rd meeting of the Astronomical Society of India, NCRA, Pune, India
- Sep–2014 Attended a workshop on Advanced Radio Astronomy, NCRA, Pune, India
- Mar–2014 Attended and presented a poster in the 32nd meeting of the Astronomical Society of India, IISER Mohali, India
- Dec–2013 Presented a poster in conference The Metre Wavelength Sky: Celebrating 50 years of Radio Astronomy at TIFR & 10 years of GMRT, NCRA, Pune, India
- Feb–2011 Attended the 29th meeting of the Astronomical Society of India, Raipur, India

SUCCESSFUL OBSERVING PROPOSALS

- Proposal-1 **Does PSR J1833–1034 have a “GigaHertz Peaked” Spectrum ? (Proposal Code :- 22_071)**

- Time Allotted 20 hours of highly competitive Giant Metrewave Radio Telescope (GMRT) time. The GMRT is worlds largest radio telescope working at low radio frequencies (50-1500 MHz).
- Role **Co-Investigator, observations and data analysis**
- Proposal-2 **Imaging radio recombination line emission from Galactic PDR/Partially ionized region/HII region- a pilot project (Proposal Code :- 24_054)**
- Time 36 hours of the GMRT time was allotted.
- Role **Co-Investigator, observations and data analysis**
- Proposal-3 **Imaging radio recombination line emission from Galactic PDR/Partially ionized region/HII regions (Proposal Code :- 25_008)**
- Time 24 hours of the GMRT time was allotted.
- Role **Principal Investigator, observations and data analysis**

PREVIOUS PROJECTS

- Project-1 **Astronomical Observations of Stars and Star Clusters with 14–inch Celestron Telescope at TIFR and Astronomical Image Processing.**
- Supervisor Professor D. K. Ojha, TIFR, Mumbai.
- Description This project involved the calibration of CCD by measuring the “Atmospheric Extinction” coefficients and derive the “Colour transformation equations” and HR-diagram of globular cluster M–16.
- Project-2 **Does PSR J1833–1034 have a “Gigahertz Peaked” Spectrum ? & Diagnostic using Raw Voltage mode of the GMRT Software Back-end.**
- Supervisor Professor Yashwant Gupta, NCRA-TIFR, Pune.
- Description This project included two sub projects. First project involved a detail investigation of spectrum of pulsar J1833–1034. To investigate that, multi-frequency GMRT observations of pulsar and flux calibrators were made. Second one was a software instrumentation project where a diagnostic package was developed and tested for Raw Voltage mode of GMRT Software Back-end (GSB).

COMPUTER SKILLS

- Programming Python, Fortran, C, Shell scripting, Linux, Interactive Data Language (IDL)
- Operating System Linux, Windows
- Astronomy Software Astronomical Image Processing System (AIPS), Groningen Image Processing System (GIPSY), Image Reduction and Analysis Facility (IRAF), DS9 (general purpose software for visualizing astronomy images), Karma (the general-purpose image/movie display tool which can load multiple datasets, display multiple windows.), Pulsar Exploration and Search TOOLkit (PRESTO)
- Productivity Applications \LaTeX , Open Office, Microsoft Office, GNUplot, PGPLOT, GRACE, Vi editor, GIMP

SCIENCE POPULARIZATION AND PUBLIC OUTREACH

- 2016–2017 Worked as a committee member for science day held at Radio Astronomy Centre, NCRA-TIFR, Ooty
- 2012–2014 Worked as a committee member for science day held at Giant Metrewave Radio Telescope (GMRT). Volunteered many outreach programmes such as Transit of Venus, Day Time Astronomy, Sky gazing programs and Solar eclipse exhibitions
- 2011 Worked as a LOC member for 29th Scientific Meeting of Astronomical Society of India

- 2009 Worked as a committee member in a 3 Days State Level Camp for College Students, Celebration of International Year of Astronomy at Pandit Ravishankar Shukla University, Raipur, India
- 2007 Worked for science popularization committee of Tata Institute of Fundamental Research, Mumbai, India

MEMBERSHIPS

1. Life member of the Astronomical Society of India

LANGUAGES KNOWN

Hindi	Speak, Read, Write	<i>Mother tongue</i>
English	Speak, Read, Write	<i>fluent</i>