

Sarvesh Mangla

Research Associate

PERSONAL DETAILS

DATE OF BIRTH: 7th July 1991
DESIGNATION: Research Scholar (UGC-Fellow; SRF)
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RESEARCH INTEREST

Space Weather: Comprehensive characterization of the ionosphere through the integration of GPS and radio interferometric data. My research endeavors to delve into the intricacies of the Equatorial Ionization Anomaly (EIA) region and study geo-magnetic storms using low-frequency radio interferometric data.

Radio Astronomy: Develop innovative pipelines for low-frequency interferometric radio data analysis, which includes RFI (Radio Frequency Interference) flagging, calibration, imaging as well as direction-dependent calibration to deal with ionospheric corruption.

TECHNICAL SKILLS

<i>Operating Systems</i>	Linux (CentOS, Ubuntu), WINDOWS
<i>Statistical Analysis</i>	Tools are written in python (with parallel processing)
<i>Tools & Pipelines Developed</i>	modified CASA based Direction-Independent Calibration Pipeline: https://gitlab.com/mangla-sarvesh/GMRT_DI_Calibration_pipeline TEC gradient Analysis tool: SpecTRal ANalysis of GradiEnts (STRANGE): https://gitlab.com/mangla-sarvesh/iono_spectral-analysis Developing 2D TEC maps using 'Field-based method': (in Prep) Creating TEC gradient Maps: Time Domain Analysis: https://gitlab.com/mangla-sarvesh/iono_temporal-analysis Contributed to Self-calibration Pipeline using STIMELA https://gitlab.com/akriti-sinha/selfcal-pipeline
<i>Radio Observations</i>	(u)GMRT, VLA, eMERLIN, MeerKAT
<i>Scientific Packages</i>	CASA , PyBDSF , OSKAR , AOFlogger , SPAM , WSClean , Stimela , killMS , CubiCal
<i>Version Control</i>	Git
<i>Text Processing</i>	LaTeX, Overleaf, MS-Office, LibreOffice
<i>Graphics</i>	Matplotlib, Plotly , Seaborn , gnuplot
<i>Web tools (Beginner)</i>	HTML, CSS
<i>Cluster computing</i>	Experience of handling several server/cluster computers Operation, Configuration, and Installation of astronomical packages for multiple users

OBSERVATION PROPOSALS

upgraded Giant Metrewave Radio Telescope:

1. "A pilot study of ionospheric disturbances in the Northern and Southern hemispheres with the uGMRT using sub-array configuration" as **Principal Investigator (PI)**, Proposal ID: 43_109
2. "The search for redshifted HI signal in z range 1.8–3.7 with the uGMRT" as **Co-PI**, Proposal ID: 45_124

PUBLICATIONS

1. **Sarvesh Mangla**, Abhirup Datta; “*Study of equatorial ionosphere using the Giant Metrewave Radio Telescope (GMRT) at sub-GHz frequencies*”; Published in [MNRAS](#); [arXiv:2204.04230]; DOI: [10.1093/mnras/stac942](#)
2. **Sarvesh Mangla**, Sumanjit Chakraborty, Abhirup Datta and Ashik Paul; “*Exploring Earth’s Ionosphere and its effect on low radio frequency observation with the (u)GMRT and the SKA*”; Published in [JoAA](#); [arXiv:2211.09738]; DOI: [10.1007/s12036-022-09900-0](#)
3. **Sarvesh Mangla**, Abhirup Datta; “*Spectral Analysis of Ionospheric Density Variations Measured With the Large Radio Telescope in the Low-Latitude Region*”; Published in [GRL](#); [arXiv:2307.05687]; DOI: [10.1029/2023GL103305](#)
4. Akriti Sinha, **Sarvesh Mangla**, Abhirup Datta; “*The spectral study of the faint radio sources in the ELAIS N1 field*”; Accepted for publication in [JoAA](#); [arXiv:2308.05192]

PEER-REVIEWED CONFERENCE PROCEEDINGS

1. “*Probing equatorial ionosphere using GMRT at sub-GHz frequencies*”, **Sarvesh Mangla** and Abhirup Datta; 2022 3rd URSI Atlantic and Asia Pacific Radio Science Meeting (AT-AP-RASC); [10.23919/AT-AP-RASC54737.2022.9814349](#)
2. “*Exploring equatorial ionosphere using the GMRT*”, **Sarvesh Mangla** and Abhirup Datta; 2022 4th COSPAR Scientific Assembly; [2022cosp...44..703M](#)
3. “*Characterizing travelling ionosphere disturbances (TIDs) using the GMRT*”, **Sarvesh Mangla** and Abhirup Datta; American Geophysical Union, Fall Meeting 2021; [2021AGUFMSA15A1912M](#)
4. “*Spectral analysis of ionospheric TEC gradients observed with the GMRT at sub-GHz frequencies*”, **Sarvesh Mangla** and Abhirup Datta; American Geophysical Union, Fall Meeting 2020; [2020AGUFMSA0090001M](#)
5. “*Constraining Equatorial Ionosphere using the GMRT*”, **Sarvesh Mangla** and Abhirup Datta; AAS id. 311.06. Bulletin of the American Astronomical Society; [2020AAS...23631106M](#)

EDUCATION

JULY 2018 - JULY 2023	PhD scholar, DAASE Indian Institute of Technology (IIT) Indore, India Supervisor: Prof. Abhirup Datta
JULY 2013 - JULY 2015	Master of Science in Physics, University of Pune, Maharashtra, India Master Thesis: Effect of Solar Activity on Cosmic Ray Muon Flux Supervisor: Prof. Joydeep Bagchi
JULY 2010 - JUNE 2013	Bachelor of Science (H) in Physics, Ramjas College, University of Delhi, Delhi, India

WORK EXPERIENCE

July 2018 - July 2023	Research Scholar at Indian Institute of Technology Indore, Madhya Pradesh Thesis: Probing low-latitude Ionosphere using the Giant Metrewave Radio Telescope
Jan 2018 - July 2018	Junior Research Fellow at Laser Science and Technology Centre, DRDO Built simulation for “Beam Quality (M^2) for Multiple Beams using Spectral Beam Combining.”
Sept 2015 - Dec 2017	Subject Physics Expert at Chegg India as Freelancer

TEACHING AND MENTORING

- June - July 2022 Mentored [an undergraduate student](#) for Internship in learning *Various statistical studies using Python*.
- May - July 2021 Mentored two undergraduate students for Summer Internship on Ionosphere study with GPS based measurements
- Feb 2021 Tutorial in Radio astronomy data analysis for Master's students (AA 474/674N - Basics of Radio Astronomy) [[Youtube Link](#)]
- Oct 2019 - Jan 2020 Mentored an undergraduate intern under [TEQIP](#) for project on detecting ionospheric variations using FFT.
- July - Nov 2019 Teaching Assistant at IIT Indore in MSc Astronomy Laboratory-I (AA 651)
- Jan - May 2019 Teaching Assistant at IIT Indore in MSc Astronomy Laboratory-II (AA 652)

PARTICIPATION & ACHIEVEMENTS

1. "Travel grant winner" from PITHIA-NRF project to attend the [First PITHIA-NRF Training School](#) which will be held in Rome, Istituto Nazionale di Geofisica e Vulcanologia headquarters, from 29 May to 1 June 2023.
2. "CSIR Foreign Travel Grant" from Council of Scientific and Industrial Research to attend and present my [Paper](#) at 44th [COSPAR Scientific Assembly](#), Greece during 16 - 24 July 2022.
3. "Best Poster Award" from **Indian Academy of Sciences** during 39th Annual Meeting of the Astronomical Society of India (ASI) during 18th – 23rd Feb, 2021. [[Link](#)]
4. Winner of "100 Hours of Astronomy 2.0 Project" organised by **IAU (International Astronomy Union)**. [[Ten winners received a Bresser Refractor Telescope](#)]
5. [JRF-UGC](#) in Physics, All India Rank - 130; Dec 2016
6. [GATE-2017](#) in Physics, All India Rank - 328
7. [JEST-2017](#) in Physics, All India Rank - 187
8. Achieved 296 Olympiad Rank in International Olympiad of Mathematics 2008.

INVITED TALKS

- 5th October 2022 [ASTRON](#), Dwingloo during Astrolunch
- 10th October 2022 [The Kapteyn Astronomical Institute](#), University of Groningen

ORAL PRESENTATIONS

1. "Characterizing low-latitude Ionosphere with GMRT" at the 5th [URSI-RCRS 2022](#) hosted by IIT Indore, during 1 - 4 December 2022. [[Conference](#)]
2. "Characterizing low-latitude ionosphere using the SKA pathfinder: the GMRT" at the [SPARCS XI: The Rise of Sky Surveys](#) meeting, during 21 - 25 November 2022. [[Conference](#)] [[Abstract](#)]
3. "Exploring equatorial ionosphere using the GMRT" at the [44th COSPAR Scientific Assembly - COSPAR 2022](#) during 16 - 24 July 2022. [[Conference](#)] [[Abstract](#)]
4. "Probing equatorial ionosphere using GMRT at sub-GHz frequencies" at the [URSI AT-AP-RASC 2022, 3rd URSI Atlantic / Asia-Pacific Radio Science Meeting - 2022](#) during 29 May - 3 June 2022. [[Link](#)]
5. "Equatorial ionospheric study using GMRT" at the 21st [National Space Science Symposium \(NSSS\)](#) hosted by IISER Kolkata, during 31 January - 4 February, 2022. [[Abstract](#)] [[Talk](#)]
6. "Ionospheric study using GMRT" at the [First Indian Space Weather Conference](#) hosted by Physical Research Laboratory (PRL), Ahmedabad, India during 11 - 12 January, 2022. [[Abstract](#)]
7. "Constraining ionosphere and space weather activities using the GMRT" at the 8th [Annual Science At Low Frequencies \(SALF\) Conference](#), during 6 - 9 December, 2021. [[Talk](#)]

8. “Exploring equatorial ionosphere using the Giant Metrewave Radio Telescope (GMRT)” at the Virtual **The SPARCS X: Capturing Science from the Pathfinder Survey Data** meeting, during 15-19 November, 2021. [[Abstract](#)]
9. “Spectral Analysis of the Equatorial Ionosphere observed using Giant Metrewave Radio Telescope (GMRT)” at the Virtual **2021 CEDAR Workshop: TAD, TIDs and MSTIDs**, during 20-25 June, 2021. [[Talk](#)]
10. “Equatorial ionosphere study using Giant Metrewave Radio Telescope (GMRT)” at the **Virtual SKA Science Conference 2021: A Precursor View of the SKA Sky**, during 15-19 March, 2021. [[Abstract](#)]

POSTERS

1. “Quantifying ionospheric effects with the uGMRT” at the **41st Annual Meeting of the Astronomical Society of India (ASI)** hosted by IIT Indore during 1-5 March, 2023. [[Conference](#)]
2. “Probing low-latitude Earth’s ionosphere using the GMRT” at the **Frontiers in Cosmology** organised by the Raman Research Institute, Bengaluru during 20-24 February, 2023. [[Conference](#)]
3. “Probing low-latitude ionosphere using the SKA pathfinder: the GMRT” at the **Young Astronomers’ Meet 2022** organised by ARIES Nainital during 9-13 November, 2022. [[Conference](#)]
4. “Equatorial ionosphere study using the Giant Metrewave Radio Telescope (GMRT)” at the **Space Weather Workshop 2022** organized by the University Corporation for Atmospheric Research (UCAR) Cooperative Programs for the Advancement of Earth System Science (CPAESS) during 26-28 April, 2022. [[Abstract](#)] [[Poster](#)]
5. “Characterizing ionospheric disturbances using GMRT” at the **40th Annual Meeting of the Astronomical Society of India (ASI)** hosted jointly by IIT Roorkee and ARIES Nainital during 25-29 March, 2022. [[Abstract](#)] [[Poster](#)]
6. “Characterizing travelling ionosphere disturbances (TIDs) using GMRT” at the **AGU Fall meeting 2021**, 13-17 December, 2021. [[Abstract](#)] [[Poster](#)]
7. “Study of equatorial ionosphere with Giant Metrewave Radio Telescope (GMRT)” at the **39th Annual Meeting of the ASI** hosted jointly by ICTS-TIFR Bengaluru, IISER Mohali, IIT Indore and IUCAA Pune during 18-23 February, 2021. [[Abstract](#)] [[Poster](#)] [[Best Poster Award from Indian Academy of Sciences](#)]
8. “Spectral analysis of ionospheric TEC gradients observed with the Giant Metrewave Radio Telescope at sub-GHz frequencies” at the **AGU Fall Meeting 2020**, 13-17 December, 2020. [[Abstract](#)] [[Poster](#)]
9. “Constraining Equatorial Ionosphere using the Giant Metrewave Radio Telescope” at the **236th Virtual Meeting of the American Astronomical Society**, 1-3 June 2020. [[Abstract](#)] [[Poster](#)]
10. “Study of ionospheric TEC gradients with the Giant Metrewave Radio Telescope at sub-GHz frequencies.” at the **38th Annual Meeting of the Astronomical Society of India (ASI)** hosted by Indian Institute of Science Education and Research Tirupati, Andhra Pradesh during 13-17 February, 2020. [[Abstract](#)]

MEMBERSHIPS

1. Student Membership (SMO062022) of Indian Radio Science Society (**InRaSS**), since July 2022
2. **AGU** student membership (January 2020 - December 2021)
3. IEEE student member & Head of Events and Publicity, **IEEE IIT Indore Student Branch** (March 2019 - December 2020)

OUTREACH AND MISCELLANEOUS

- February 2021 Member of the team conducting “National Science Day” organised by IIT Indore
- January 2020 LoC Member for International Conference on observing “First Billion Years of the Universe” using Next Generation Telescopes held at IIT Indore [[Webpage](#)]
- October 2019 Volunteered for the Student Solar Ambassador Workshop, an initiative by IIT Bombay towards Energy Swaraj. [[Clipping](#)]
- January 2019 Core member of organizing team for the event, “Reaching for the Stars”, IAU 100 hours of Astronomy Event, IIT Indore, India. [[Webpage](#)]
- December 2018 Core member of organizing team for the event, “Bapu Khagol Mela (Gandhi Astro Fair)”, IIT Indore, India. [[Clipping](#)]

WORKSHOPS/SCHOOLS

- June 2022 Participated in Summer school “2022 Python in Heliophysics community” [[Webpage](#)]
- May 2022 Participated in GPU Bootcamp “NSM Astrophysics GPU Bootcamp organised by The Centre for Development of Advanced Computing (C-DAC) in association with SKAIC (SKA-India Consortium), NVIDIA and OpenACC. [[Webpage](#)]
- Jan-Feb 2022 Participated in “SKA Regional Centre Training Event Series” held virtually [[Webpage](#)]
- September 2021 Participated in online workshop on “High Performance Computing for Astronomy and Astrophysics” organised by SKA-India Consortium and IIT Kharagpur [[Webpage](#)]
- March 2021 Participated in the “8th VLA Data Reduction Workshop” organised by VLA, NRAO [[Webpage](#)]
- May 2019 Participated in the workshop on “Data Analysis and Machine Learning” organised by IISER Tirupati [[Webpage](#)]
- February 2019 Volunteered and participated in the “Multi-wavelength Sky observations- AstroSat and beyond” held at IIT Indore organised by TIFR Mumbai and IUCAA [[Webpage](#)]
- December 2018 Participated in the short course on “Optical Interferometry conducted by Indian Laser Association (ILA)” at RRCAT Indore.
- September 2018 Participated in the “Optics of Gravitational Wave Observatory” held at IIT Kanpur, [[Webpage](#)]

LANGUAGES

English (Fluent), Hindi (Mother tongue).

REFERENCES

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