

Bhuvnesh Brawar

RESEARCH SCHOLAR,
DEPARTMENT OF ASTRONOMY, ASTROPHYSICS
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EDUCATION

Indian Institute of Technology, Indore, Madhya Pradesh, India
PhD, Ionosphere Physics & Space Weather *Aug' 2021 - Present*
Supervisor Prof. Abhirup Datta
CGPA: 7.7/10

Central University of Rajasthan, Kishangarh, Rajasthan, India
Master of Science, Physics *Jul'2017 - May'2019*
CGPA: 6.56/10

Baby Happy Modern PG College, Hanumangarh Rajasthan, India,
(Maharaja Ganga Singh University, Bikaner, Rajasthan, India)
Bachelor of Science *Jul'2014 - Jun'2017*
Percentage: 71.41%

RESEARCH INTERESTS

My research interest lies in comprehending the underlying physical processes within the ionosphere, with a specific emphasis on investigating the impact of both extreme and quiet space weather conditions on the ionosphere and satellite-based navigation systems. Additionally, my research delves into the intricacies of ionospheric scintillation and plasma bubbles, seeking to deepen our understanding of these phenomena and their implications for space-based communication and navigation technologies.

MASTERS' THESIS/ RESEARCH PROJECT

Resource Budget Model: Synchronization in fruit bearing map
Supervisor : Prof. Manish Dev Shrivastava
School of Physical Science, CURaj *Jan '19 - Apr '19*

In this report, I reviewed the Discrete Dynamical System, One Dimensional Maps, Resource Budget Model, Synchronization in plants in photosynthate production and possible strategies to stabilize annual fruit yield. Here in the project work, I simulated the Resource Budget Model (RBM) for a single plant as well as two coupled plants. It would be helpful to find an easier way to get controlled fruit yield rather than the conventional methods like thinning and pruning. Those methods are more time-consuming and need more laborious work, and most important one should have great experience to make proper decisions. Using the grafting technique, plants can be directly coupled. It enhances the fruit production.

SKILLS

Programming Languages: MATLAB, Python(numpy, pandas, matplotlib, basemap etc.)
Markup Language: HTML
Analytical Skills: MS-Excel (office), Statistics
Word Process: MS-Word (office), L^AT_EX
Operating System: Windows, Ubuntu (Linux)
File Type: CSV, TSV, MAT, HDF5, RINEX, IONEX, TXT, CDF
Instrument: GNSS Receivers (Septentrio, u-blox), NavIC Receiver (Accord), VLF-ULF Receiver, GNSS Simulator (Orolia GSG 6)

AWARDS & ACHIEVEMENTS	<ul style="list-style-type: none"> • Fellowship for Training of Young Scientists, MPCST, MPYSC, 2025 • GATE-2021 (Physics) • GATE-2020 (Physics) • Joint CSIR-UGC-NET-LS-Dec-2019 (with NFOBC) (Physical Sciences) • Joint CSIR-UGC-NET-JRF-Jun-2020 (Physical Sciences) • JEST-2020 (Physics) • INSPIRE Scholarship for Higher Education-2014
LANGUAGE	Hindi, English, Rajasthani, Punjabi
TEACHING ASSISTANT	<ul style="list-style-type: none"> • AA 201: An Introduction to Astronomy (Autumn 2022) @IITIndore • AA 652: Astro Lab II (Spring 2023) @IITIndore • AA 403/603: Space Engineering System (Autumn 2023) @IITIndore • AA 404/604: Spacecraft and Payload Attitude Dynamics, Control and Pointing (Spring 2024) @IITIndore
EXPERIENCES	<ul style="list-style-type: none"> • URSI-RCRS 2022: Hall Management • ASI 2023: Outreach Activities • IISF 2022: Outreach and Popularization Activities • IITI Dinning Committee 2022: Inventory and Inspection • IITI HORC 2023-24: Cultural Secretary, HJB Hostel • iRAD 2024: Transport management
PUBLICATION	<ol style="list-style-type: none"> 1. Brawar, Bhuvnesh, Abhirup Datta, and Sarvesh Mangla. ‘Imaging Ionosphere’s Wave like Structure Using Interferometry Data’. Advances in Space Research: The Official Journal of the Committee on Space Research (COSPAR), July 2025. https://doi.org/10.1016/j.asr.2025.07.059. 2. Pal, Sanjoy Kumar, Soumen Sarkar, Kousik Nanda, Aritra Sanyal, Bhuvnesh Brawar, Abhirup Datta, Stelios M. Potirakis, et al. “Global Response of Vertical Total Electron Content to Mother’s Day G5 Geomagnetic Storm of May 2024: Insights from IGS and GIM Observations”. Atmosphere 16, no. 5 (30 April 2025): 529. https://doi.org/10.3390/atmos16050529. 3. Das, Shyamleena, Sovan Kumar Maity, Kousik Nanda, Shreyam Jana, Bhuvnesh Brawar, Pradipta Panchadhyayee, Abhirup Datta, and Sudipta Sasmal. “Study of the Response of the Upper Atmosphere during the Annular Solar Eclipse on October 14, 2023”. Advances in Space Research: The Official Journal of the Committee on Space Research (COSPAR) 74, no. 7 (October 2024): 3344–60. https://doi.org/10.1016/j.asr.2024.06.021. 4. Sanyal, Aritra, Bhuvnesh Brawar, Sovan Kumar Maity, Shreyam Jana, Jean Marie Polard, Peter Newton, George S. Williams, Stelios M. Potirakis, Haris Haralambous, Georgios Balasis, and et al. 2025. “Investigation of the Ionospheric Effects of the Solar Eclipse of April 8, 2024 Using Multi-Instrument Measurements” Atmosphere 16, no. 2: 161. https://doi.org/10.3390/atmos16020161.

5. Datta, Abhirup, **Bhuvnesh Brawar**, Sarvesh Mangla, Deepthi Ayyagari, and Sumanjit Chakraborty. "A Brief Review of Low-Latitude Ionosphere." *GNSS Applications in Earth and Space Observations*. CRC Press, April 7, 2025. <https://doi.org/10.1201/9781032712444-27>.

CONFERENCE

1. **Brawar, Bhuvnesh**, Abhirup Datta, and Sudipta Sasmal. "Climatology of Ionospheric Irregularities during Ascending phase of the 25th solar cycle near EIA's Northern Crest" *S²-STEP2025 & IPSC-2025*, IIT Roorkee
2. **Brawar, Bhuvnesh**, Abhirup Datta, Deepthi Ayyagari, and Sudipta Sasmal. "Ionospheric Plasma Bubbles Characterisation Using NavIC Satellites". In *Proceedings of the 6th URSI Regional Conference on Radio Science - RCRS 2024*. Gent, Belgium: URSI - International Union of Radio Science, 2024. https://doi.org/10.46620/ursi_rsrc24/1070cxl4177.
3. **Brawar, Bhuvnesh**, and Abhirup Datta. "Exploring the Impact of Solar Flares on Earth's Ionosphere Using a Multi-Messenger Approach". *National Space Science Symposium (NSSS)-2024*, PS2-137, <https://nsss2024.unigoa.ac.in/wp-content/uploads/2024/01/NSSS2024-Accepted-Abstracts-PS-2.pdf>
4. Jagne, Mohit, **Bhuvnesh Brawar**, and Abhirup Datta. "Ensemble Machine Learning Model for Ionospheric TEC Prediction over Low-Latitude Regions". In *2023 8th International Conference on Computers and Devices for Communication (CODEC)*, 1–2. IEEE, 2023. <https://doi.org/10.1109/codec60112.2023.10465765>.
5. **Brawar, Bhuvnesh**, Abhirup Datta, and Sarvesh Mangla. "Estimation of 3D Electron Density Distribution over the Indian Low Latitude Region Using NavIC Data". *AGU Fall Meeting Abstracts 2022 (2022)*: SA34A-02. <https://ui.adsabs.harvard.edu/abs/2022AGUFMSA34A..02B/abstract?>
6. **Brawar, Bhuvnesh**, Abhirup Datta, and Sarvesh Mangla. "3D IED profile over the Indian Sector with LS-MARS method using NavIC aided GNSS data." *URSI-RCRS 2022*.

WORKSHOPS & SCHOOLS

1. Beginner to Advanced MATLAB by Mathworks team & IEEE Student Branch IIT Indore at IIT Indore, India at May 5, 2022
 2. Radio Astronomy School-2023 by NCRA-TIFR, Pune, India; Mar 13-24, 2023.
 3. GNSS Summer School 2024 by Tokyo University of Marine Science and Technology, Japan; Sep 2-5,2024. (online)
 4. VIII Aditya-L1 Workshop at IIT Indore, India; Sep 27-29,2024.
 5. Ionospheric Measurement Techniques and Instrumentation jointly organised by URSI, In-RASS, ARIES & GEHU at GEHU, Bhimtal, India; Oct 22, 2024
 6. Ionospheric Scintillations and Its Effects on Global Navigation Satellite System by Koneru Lakshmaiah Education Foundation, Guntur, India; Dec 27-28, 2024. (online)
 7. Ionospheric Impacts on GNSS and International Collaboration to Meet Current and Future Solar Activity Period Challenges, Vienna International Centre, June 25 – 26, 2025. (online)
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REFERENCES

Prof. Abhirup Datta

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