

# Bhuvnesh Brawar

RESEARCH SCHOLAR,  
DEPARTMENT OF ASTRONOMY, ASTROPHYSICS  
& SPACE ENGINEERING, IIT INDORE

Indian Institute of Technology Indore,  
Indore, Madhya Pradesh- 453552, India  
[phd2101121005@iiti.ac.in](mailto:phd2101121005@iiti.ac.in) | [bbrawar@gmail.com](mailto:bbrawar@gmail.com)  
ORCID : [0009-0000-1529-3270](https://orcid.org/0009-0000-1529-3270)  
Linkedin : [bhuvnesh-brawar](https://www.linkedin.com/in/bhuvnesh-brawar)  
Github : [bbrawar](https://github.com/bbrawar)  
Contact No.: +91-7740828405

---

## 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<sup>A</sup>T<sub>E</sub>X  
**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"> <li>• GATE-2021</li> <li>• GATE-2020</li> <li>• Joint CSIR-UGC-NET-LS-Dec-2019 (with NFOBC)</li> <li>• Joint CSIR-UGC-NET-JRF-Jun-2020</li> <li>• JEST-2020</li> <li>• INSPIRE Scholarship for Higher Education-2014</li> </ul>
LANGUAGE	<i>Hindi, English, Rajasthani, Punjabi</i>
HOBBIES	<i>Playing Badminton, Listening Music, Trekking, Solving Sudoku</i>
TEACHING ASSISTANT	<ul style="list-style-type: none"> <li>• <b>AA 201:</b> An Introduction to Astronomy (Autumn 2022) @IITIndore</li> <li>• <b>AA 652:</b> Astro Lab II (Spring 2023) @IITIndore</li> <li>• <b>AA 403/603:</b> Space Engineering System (Autumn 2023) @IITIndore</li> <li>• <b>AA 404/604:</b> Spacecraft and Payload Attitude Dynamics, Control and Pointing (Spring 2024) @IITIndore</li> </ul>
EXPERIENCES	<ul style="list-style-type: none"> <li>• <b>URSI-RCRS 2022:</b> Hall Management</li> <li>• <b>ASI 2023:</b> Outreach Activities</li> <li>• <b>IISF 2022:</b> Outreach and Popularization Activities</li> <li>• <b>IITI Dinning Committee 2022:</b> Inventory and Inspection</li> <li>• <b>IITI HORC 2023-24:</b> Cultural Secretary, HJB Hostel</li> <li>• <b>iRAD 2024:</b> Transport management</li> </ul>
PUBLICATION	<ol style="list-style-type: none"> <li>1. Das, Shyamleena, Sovan Kumar Maity, Kousik Nanda, Shreyam Jana, <b>Bhuvnesh Brawar</b>, Pradipta Panchadhyayee, Abhirup Datta, and Sudipta Sasmal. "Study of the Response of the Upper Atmosphere during the Annular Solar Eclipse on October 14, 2023". <i>Advances in Space Research: The Official Journal of the Committee on Space Research (COSPAR)</i> 74, no. 7 (October 2024): 3344–60. <a href="https://doi.org/10.1016/j.asr.2024.06.021">https://doi.org/10.1016/j.asr.2024.06.021</a>.</li> <li>2. Sanyal, Aritra, <b>Bhuvnesh Brawar</b>, 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" <i>Atmosphere</i> 16, no. 2: 161. <a href="https://doi.org/10.3390/atmos16020161">https://doi.org/10.3390/atmos16020161</a>.</li> <li>3. Datta, Abhirup, <b>Bhuvnesh Brawar</b>, Sarvesh Mangla, Deepthi Ayyagari, and Sumanjit Chakraborty. "A Brief Review of Low Latitude Ionosphere: With Multi-Frequency Observation using GPS, NavIC and GMRT" <i>GNSS applications in Earth and space observations: challenges and prospective approaches. (In Press)</i></li> </ol>

## CONFERENCE

1. **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](https://doi.org/10.46620/ursi_rsrc24/1070cxl4177).
2. **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>
3. 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>.
4. **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?>
5. **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. Radio Astronomy School-2023 by NCRA-TIFR, Pune, India; Mar 13-24, 2023.
  2. GNSS Summer School 2024 (online) by Tokyo University of Marine Science and Technology, Japan; Sep 2-5,2024.
  3. VIII Aditya-L1 Workshop at IIT Indore, India; Sep 27-29,2024.
  4. Ionospheric Scintillations and Its Effects on Global Navigation Satellite System by Koneru Lakshmaiah Education Foundation, Guntur, India; Dec 27-28, 2024.
-