Curriculum vitae

Sovan Saha

Scientist-C
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Date of Birth: 13 October 1993
Gender: Male
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Employment:

- **April 2024 - present: Scientist-C**, Indian Centre for Space Physics, Kolkata, India
- **September 2022 - April 2024: Post-doctoral Fellow**, Physical Research Laboratory, Ahmedabad, India

Research Interest:

- Investigations of Upper atmospheric processes using optical and radio techniques.
- Investigation of equatorial plasma irregularities, atmospheric waves in the upper atmosphere, space weather.
- The systematic changes of the upper atmosphere during geomagnetic quiet and disturbed period.
- Exploring different kinds of datasets: optical, radio, magnetic both in ground- and space-based to understand the ionosphere-thermosphere behaviour.
- Development and calibration of ground and space-based instruments.

Skills and expertise:

- Knowledge of programming languages, such as, **Interactive Data Language (IDL), Python**.
- Expertise in **fabrication of optical instruments** and **operating radio instruments** like **Digisonde** used as ground-based instruments for Upper atmospheric observation.
- I have used **Fourier analysis, Lom-Scargle Periodogram, Wavelet analysis, least square method** during the data analysis.
- Experience of **handling large datasets**.
- **Optical and radio data analysis** for upper atmospheric research.

Academic qualification:

- **2017-2022**: Ph.D. in Physics, Physical Research Laboratory, Ahmedabad, India; degree awarded by Indian Institute of Technology Gandhinagar, India. Thesis title: 'Investigations of Low- and Equatorial-latitude Upper Atmospheric processes using Optical and Radio Techniques'.
- **2015-2017**: M.Sc. in Physics, Ramakrishna Mission Vivekananda University, Belur, India
- **2012-2015**: B.Sc. in Physics, Calcutta University, Kolkata, India

Achievements:

- Department of Science and Technology (DST), Govt. of India sponsored **INSPIRE Scholar** for 5 years in 2012-2017.

- **Qualified** national level examinations like,
  - Joint Admission Test for MSc (**JAM**) in 2015.
  - Joint Entrance Screening Test (**JEST**) for **Int. PhD.** In 2016.
  - Joint Entrance Screening Test (**JEST**) for **PhD.** in 2017.
  - Graduate Aptitude Test Engineering (**GATE**) in physics in 2017.
- Qualified The Council of Scientific and Industrial Research University Grants Commission (CSIR-UGC) National Eligibility Test (**NET (Lectureship)**) in 2017.

Professional services/Awards:

- **2022 COSPAR Outstanding Paper award for Young Scientist.**
- **Student/ Early-career convener: AGU Fall meeting 2022 of the session SA004**: *Advances in the Understanding of the Equatorial Ionization Anomaly (EIA) and Ionospheric Irregularities (e.g., Scintillations, Equatorial Plasma Bubbles, Spread-F) Using Measurements and Modeling.*
- Served as **rapporteur** at first **Indian Space Weather Conference (ISWC-2022)** during 11-12 January 2022 held at Physical Research Laboratory, Ahmedabad.
- **Guided a BS-MS student of IISER, Mohali in his summer project** at Physical Research Laboratory, entitled 'Investigations of Variations in the OI Nightglow Emissions over Low-latitudes' sponsored by India Academy of Sciences.
- **Reviewer** - Journal of Earth, Planet and Space (Springer), Journal of Geophysical Research- Space Physics.

Projects:

i. **"Dispersive elements in optics"** did project as a part of PhD. Coursework under the guidance of Prof. Duggirala Pallamraju on January-April, 2018.
ii. **"The auroral processes"** did project as a part of PhD. Coursework under the guidance of Prof. Duggirala Pallamraju on May-June, 2018.
iii. **"Magnetospheric substorm"** did project as a part of PhD. Coursework under the guidance of Prof. Dibyendu Chakrabarty on August-December, 2017.
iv. **"Neutrino physics: Dirac and Majorana neutrinos"** MSc. Project did under the guidance of Prof. Debashis Gangopadhyay, on January-May, 2017.

Outreach activity:

- **Science Express:** Visited schools at the remote areas in India, demonstrated science experiments to the school students funded by PRL.
- **National Science Day:** Volunteered and demonstrated the science experiments in the public outreach during this event Organized in PRL every year at the end of February on the occasion of National Science Day.

Publications:

1. **Saha, S.**, Pallamraju, D., Pant, T. K., & Chakrabarti, S. (2021). On the cause of the post-sunset nocturnal OI 630 nm airglow enhancement over low-latitude thermosphere. Journal of Geophysical Research: Space Physics, 126, e2021JA029146. https://doi.org/10.1029/2021JA029146.
2. **Saha, S.**, Pallamraju, D., & Ghodpage, R. (2022). Investigation of equatorial plasma bubbles as observed in the OI 630 nm nightglow emissions over off-equatorial and low-latitudinal locations over Indian longitudes. Advances in Space Research. https://doi.org/10.1016/j.asr.2022.08.023.
3. **Saha, S.** & Pallamraju, D. (2022). Latitudinal Variations in the Nocturnal behaviour of OI 630 nm Airglow Emissions and their relationship with the Equatorial Electrodynamics. Journal of Atmospheric and Solar-Terrestrial Physics. https://doi.org/10.1016/j.jastp.2022.105965.
4. Pallamraju, D., Mandal, S., **Saha, S.**, Kumar, S., & Pant, T. K. (2022). New insights on the precursors to the onset of equatorial plasma irregularity generation. In 2022 URSI Regional

Conference on Radio Science (USRI-RCRS) (pp. 1-4). IEEE. https://doi.org/10.23919/URSI-RCRS56822.2022.10118477.

5. Pallamraju, D., Suryawanshi, P., Urmalia, S., Kumar, S., **Saha, S.**, Singh, R. P., Kushwaha, P., & Soni, M. (2023). CDAP: A portable CCD-based daytime airglow photometer for investigations of ionosphere-thermosphere phenomena. Journal of Atmospheric and Solar- Terrestrial Physics, 244, 106025. https://doi.org/10.1016/j.jastp.2023.106025.
6. **Saha, S.**, Pallamraju, D., Kumar, S., Laskar, F., & Pedatella, N. M. (2024). OI 630.0 nm post-sunset emission enhancement as an effect of tidal activity over low-latitudes. 10.22541/essoar.169008301.17329599/v2. (under-revision)

School/Workshop attended:

1. **Incoherent Scatter Radar (ISR) Summer School -2020** in Lowell, Massachusetts which was arranged in virtual mode during 27 Jul- 01 Aug 2020.
2. **C K Majumdar Memorial Summer workshop in Physics** organized in association with Indian Association of Physics Teachers (IAPT) held at S N Bose National Centre for Basic Sciences (SNBNCBS), Kolkata, India during 26 May- 05 June 2015.

Presentations in conferences:

1. **Sovan Saha**, "Investigations of the Equatorial Electrodynamics and Thermospheric Tides using DISHA", 2nd Indian Space Weather Conference, Physical Research Laboratory, India, 19-20 October 2023. [Oral by SS]

2. **Sovan Saha**, Duggirala Pallamraju, and Rupesh N. Ghodpage, "Gravity Wave Scale Sizes associated with the Equatorial Plasma Bubbles observed over Low- and Off-Equatorial Latitudes in India", 3rd Equatorial Plasma Bubble workshop, Indian Institute of Geomagnetism, India, 13-15 September 2023. [Oral by SS]

3. Duggirala Pallamraju, Subir Mandal, **Sovan Saha**, and Sunil Kumar, "On the daytime precursors of the equatorial spread F", PRESTO Workshop & School, Italy, 29 May - 2 June 2023. [oral by DP]

4. **Sovan Saha**, Duggirala Pallamraju, and Rupesh N. Ghodpage, "Investigation of Gravity Wave Scale Sizes present in the low-/ equatorial latitude upper atmosphere with and without Plasma Bubbles as seen in the OI 630.0 nm Nightglow Emissions", American Geophysical Union Fall meeting, Chicago, USA, 12-16 December 2022. [Oral by SS]

5. **Sovan Saha**, and Duggirala Pallamraju, "Latitudinal Movement seen in the OI 630.0 nm Nightglow Emissions in Poleward and Equatorward Directions and their relationship with Equatorial Electrodynamics", American Geophysical Union Fall meeting, Chicago, USA, 12-16 December 2022. [Poster by SS]

6. Duggirala Pallamraju, Subir Mandal, **Sovan Saha**, Sunil Kumar and Tarun K. Pant, "New insights on the precursors to the onset of equatorial plasma irregularity generation", URSI-RCRS, IIT Indore, 1-4 December 2022. [oral by DP]

7. **Sovan Saha**, and Duggirala Pallamraju, "Effect of Equatorial Electric Fields seen in the Latitudinal Movement of the OI 630 nm Nocturnal Emissions over Indian Longitude", 16th International Symposium on Equatorial Aeronomy (ISEA-16), Kyoto University, Japan, 12-16 September 2022. (presented online) [Poster]

8. **Sovan Saha**, Duggirala Pallamraju, and Rupesh N. Ghodpage, "Characteristics Gravity Wave Scale Sizes present in the Plasma Bubbles as seen in the OI 630 nm Nightglow Emissions over Low-Latitudes", 16th International Symposium on Equatorial Aeronomy (ISEA-16), Kyoto University, Japan, 12-16 September 2022. (presented online) [Poster]

9. Duggirala Pallamraju, **Sovan Saha**, Sunil Kumar, "Variations in OI 630 nm Dayglow and Nightglow emissions over low-/equatorial latitudes and their dependence on neutral winds and equatorial electric fields". Presented at 44th scientific assembly COSPAR-2022, Athens, Greece, 16-24 July, 2022. [Oral by DP]

10. **Sovan Saha**, Duggirala Pallamraju, and Rupesh N. Ghodpage, "Dynamics and Structure of Plasma bubble observed in the OI 630 nm nightglow emissions over low and off-equatorial latitudes". Presented at the 15th Quadrennial Solar-Terrestrial Physics (STP-15) symposium, Indian Institute of Geomagnetism, Navi Mumbai, India, 21-25 February 2022. (presented online) [Oral by SS]

11. **Sovan Saha** and Duggirala Pallamraju, "Latitudinal movement of the EIA crest as seen in OI 630 nm nightglow emissions over low-latitudinal region of Indian longitude". Presented at the 15th Quadrennial Solar-Terrestrial Physics (STP-15) symposium, Indian Institute of Geomagnetism, Navi Mumbai, India, 21-25 February 2022. (presented online) [Oral by SS]

12. **Sovan Saha**, Duggirala Pallamraju, and Tarun K. Pant, "OI 630 nm nightglow variability during post-sunset time over low-latitude thermosphere". Presented at the 21th National Space Science Symposium (NSSS-2022), IISER, Kolkata, 31 January-04 February, 2022. (presented online) [Oral by SS]

13. **Sovan Saha** and Duggirala Pallamraju, "Influence of Seasonal and Solar Flux Variations on the Low-latitude OI 630 nm Thermospheric Nightglow". Presented at the Joint Scientific Assembly IAGA-IASPEI-2021, CSIR-NGRI, Hyderabad, 21-27 August 2021. (presented online) [Oral by SS]

14. **Sovan Saha**, Duggirala Pallamraju, and Rupesh N. Ghodpage, "Coupling of the Ionospheric Plasma as investigated using OI 630 nm Emissions from Low- and Offequatorial Latitude locations in Indian Longitudes". Presented at the Joint Scientific Assembly IAGA-IASPEI-2021, CSIR-NGRI, Hyderabad, 21-27 August 2021. (presented online) [Oral by SS]

15. **Sovan Saha**, Duggirala Pallamraju, and Tarun K. Pant, "On the Cause of Postsunset Enhancement in OI 630 nm Airglow Emission over Low-latitude Thermosphere". Presented at the Joint Scientific Assembly IAGA-IASPEI-2021, 21-27 August 2021. (presented online) [Oral by SS]

16. **Sovan Saha** and Duggirala Pallamraju, "Investigation of the Variability in OI 630 nm Nightglow Emission over Low-latitude Thermosphere". Presented at the CEDAR workshop-2021, 20-25 June 2021. (presented online) [Poster]

17. Subir Mandal, Duggirala Pallamraju, Deepak Kumar Karan, Ravindra Pratap Singh, Pradip Suryawanshi, and **Sovan Saha**, "Gravity wave characteristics over low-latitude upper atmospheric region obtained by Digisonde". Presented at 20th National Space Science Symposium (NSSS-2019), Savitribai Phule Pune University, Pune, 29-31 January, 2019. [Poster]

18. **Sovan Saha** and Duggirala Pallamraju, "OI 630.0 nm nightglow emission variability from Gurushikhar, Mt. Abu, a region under the crest of equatorial plasma fountain effect". Space and Atmospheric Science (NCSAS-2019), Sanjay Ghodawat University, Kolhapur, 10-11 May, 2019. [Poster]