SAHIL JHAWAR

sahil.jhawar448@gmail.com ◇ jhawarji ◇ sahiljhawar ◇ sahiljhawar.in

EDUCATION

Universität Potsdam *October 2021 - June 2025*
Master of Science in Astrophysics *Potsdam, Germany*
Grade*: 1.7 (gut/good)
Thesis

Coursework:

- Gravitational Wave Astrophysics
- General Relativity
- Multi-messenger astronomy
- Computational Astrophysics
- Bayesian Statistics†
- Statistics†

Christ (Deemed to be University) *July 2018 - June 2021*
Bachelor of Science (Physics, Maths and Electronics) *Bengaluru, India*
GPA: 3.68/4.0

Final Year Project: Gesture Controlled System based on Raspberry Pi Pico *Report*

WORK EXPERIENCE

GFZ Helmholtz Centre for Geosciences *July 2024 - Present*
Research Assistant - July 2025 - Present *Potsdam, Germany*
Student Assistant - July 2024 - June 2025
Software Developer in the Section 1.5 - Space Physics and Space Weather

- Developed a real-time ETL pipeline and testing framework for processing NASA/JAXA spacecraft data, implementing over 4,000 lines of code.
- Deployed and maintaining quasi-real-time space-physics based machine learning model and testing of the translated Python-based workflows.
- Migrated ∼2,500 lines of legacy code to Python, including data assimilation algorithms from MATLAB and geomagnetic models from FORTRAN.
- Collaborated with team members to ensure seamless implementation
- Developed software deliverables for the European Space Agency as part of funded research projects.
- Developed a Python-based space weather monitoring system using in-house forecasted Kp data for real-time analysis, threshold-based alerting, and automated email reporting.

Leibniz-Institut für Astrophysik Potsdam (AIP) *December 2022 - March 2024*
Student Assistant *Potsdam, Germany*
Student Assistant in the Project Management team for building (integration, installation and maintenance) the 4-metre Multi-Object Spectroscopic Telescope *4MOST*.

- Implemented *4MOST* commissioning procedures during 3 week coding campaign (November 2023)
- Utilized technical skills in troubleshooting and problem-solving within the specialized environment of an astronomical integration hall.

*See here on how to interpret German grade: Welche Form der Benotung wird an der Uni Potsdam verwendet?
†University coursework without credits

- Proactively managed procurement activities, liaising with vendors to procure essential large-scale items for the integration hall.

RESEARCH EXPERIENCE

Theoretical Astrophysics Group, Universität Potsdam *March 2023 - June 2025*
Master's Thesis *Potsdam, Germany*
Master's thesis student under **Prof. Dr. Tim Dietrich**.

- Maintaining and contributing to software infrastructure with over 60 forks, 40+ stars, and 15,000+ Conda downloads.
- Developed Bayesian models for analyzing astronomical datasets using NMMA, focusing on optimizing parameter estimation.
- Quantified and minimized non-stationary uncertainties by 2-10x in astrophysical parameter estimation and predictions.
- Designed a SHA-256 hash-based system to verify and automate file replacement for data consistency required for astrophysical simulations.
- Presented my findings as the first author on one research paper and as a co-author on another.

Universität Potsdam & Astronomical Institute of CAS *August 2022 - September 2022*
Participant *Prague, Czech Republic*

- Utilized the Perek 2m telescope at the Ondřejov Observatory to acquire stellar spectra
- Performed data reduction and analysis using IRAF Python for data visualization

IUCAA & NCRA-TIFR *December 2020 - January 2021*
Winter Student *Pune, India*
Radio Astronomy Winter School 2020: Learned basics of radio astronomy, from theory to instrumentation and computational aspects. Workshop enabled me to work on few physical experiments and on GMRT and ORT data of Vela pulsar.
Detailed reports can be found here

Krittika, IIT Bombay *May 2020 - August 2020*
Summer Project Intern *Mumbai, India*
Developed a Python package to analyse various types of binary star system.

PUBLICATIONS

1. **Sahil Jhawar**, Thibeau Wouters, Peter T. H. Pang, et al. "Data-driven approach for modeling the temporal and spectral evolution of kilonova systematic uncertainties". In: *Phys. Rev. D* 111 (4 2025), p. 043046. DOI: 10.1103/PhysRevD.111.043046.
2. M M Desai, D Chatterjee, **S Jhawar**, et al. "Rapid parameter estimation for kilonovae using likelihood-free inference". In: *Monthly Notices of the Royal Astronomical Society* 541.3 (June 2025), pp. 2619–2630. DOI: 10.1093/mnras/staf1045.
3. T. Hussenot-Desenonges, T. Wouters, N. Guessoum, et al. *Multi-band analyses of the bright GRB 230812B and the associated SN2023pel*. 2023. arXiv: 2310.14310 [astro-ph.HE].

OBSERVING EXPERIENCE

Perek 2m Telescope	Assisted with 7 nights (Ondřejov, Czech Republic)
OST 0.5m Telescope	Assisted with 2 nights (Potsdam, Germany)

TECHNICAL PROJECTS

SWVO
contributor and maintainer
Tools for downloading and reading space-weather data and geomagnetic indices.

Kp Alert
Python-based system for monitoring forecasted Kp index and sending automated alerts.

NMMA
contributor and maintainer
A Pythonic library for probing nuclear physics and cosmology with multimessenger analysis.

nbody
Direct N-body code with C++ and JAX backends.

Gstrain
Interactive Gravitational Wave strain viewer using Streamlit & Plotly. Check it out here

BibQuest
Automagically fill your bib file just using bib keys

uptime
A Github Action and Pages based uptime monitor in Python.

SKILLS

Technical Languages	Python, C\C++, LaTeX, MATLAB, SQL
Technical Skills	Git (-Lab and -Hub), Unix based OS and Windows, Bayesian Inference, Data analysis and visualisation
Packages and tools	NumPy, SciPy, Pandas, Matplotlib, Astropy, Bilby, Seaborn, Sphinx, TensorFlow, scikit-learn, JAX, PyTorch, Streamlit, Selenium, bs4, PyBind, CI\CD, Parallel computing

OUTREACH AND COMMUNITY ENGAGEMENT

Let's Talk Astronomy, Christ *November 2019 - January 2021*
Student coordinator *Bengaluru, India*
Acted as a liaison between students and faculty. Conducted 15+ talks.

LIGO-India, Vigyan Samagam (DAE-DST-NCSM, G.O.I) *September and December 2019*
Scientific Communicator *Bengaluru and Kolkata, India*
Successfully played the role of science communicator by explaining GW Science and GW Exhibits to an audience of all ages. Catered to nearly 500 visitors.

PRIZES, AWARDS AND HONORS

2024 Fully funded visiting fellowship by European Union's Horizon 2020 Programme under the AHEAD 2020 hosted by Dr. Mattia Bulla at University of Ferrara, Italy
2024 Fellowship of €500 by ESA for dotAstronomy 2024, ESAC Madrid, Spain
2023 Scholarship of ₹35,000 by Badrilal Soni Maheshwari Shiksha Sahyog Kendra, India
2021 Awarded co-curricular activities based scholarship from Christ (Deemed to be University)
2021 Won numerous inter and intra collegiate events, and successfully lead a team of players resulting in various rolling trophies for the department
2020 Gold honor in International Astronomy and Astrophysics Competition (IAAC), secured 38/40 and placed in the top 1% worldwide