

SAHIL JHAWAR

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EDUCATION

Universität Potsdam

Master of Science in Astrophysics

Grade*: 1.7 (gut/good)

Thesis 📜

October 2021 - June 2025

Potsdam, Germany

Coursework:

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

Christ (Deemed to be University)

Bachelor of Science (Physics, Maths and Electronics)

GPA: 3.68/4.0

July 2018 - June 2021

Bengaluru, India

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

WORK EXPERIENCE

GFZ Helmholtz Centre for Geosciences

Research Assistant - July 2025 - December 2025

July 2024 - 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 space-craft 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)

Student Assistant

December 2022 - March 2024

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

Master's Thesis

March 2023 - June 2025

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

Participant

August 2022 - September 2022

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

Winter Student

December 2020 - January 2021

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

Summer Project Intern

May 2020 - August 2020

Mumbai, India

Developed a Python package to analyse various types of binary star system.

PUBLICATIONS

1. **Sahil Jhawar**, Thibreau 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. Hussain-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++, L^AT_EX, 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