

# SAHIL JHAWAR

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## EDUCATION

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### Universität Potsdam

Master of Science in Astrophysics  
Grade\*: 1.8 (gut/good)

October 2021 - Present  
Potsdam, Germany

#### Coursework:

- Gravitational Wave Astrophysics
- Computational Astrophysics
- General Relativity
- Bayesian Statistics<sup>†</sup>
- Multi-messenger astronomy
- Statistics<sup>†</sup>

### 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*

## RESEARCH EXPERIENCE



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### Theoretical Astrophysics Group, Universität Potsdam

Master's Thesis

March 2023 - Present  
Potsdam, Germany

Master's thesis student under **Prof. Dr. Tim Dietrich**.

- Working on Bayesian techniques for Multi Messenger Astronomy using *NMMA* .
- Characterizing the non stationary systematic uncertainties that arise in the modeling of electromagnetic counterparts of multi-messenger source (merged PR )
- Using parallel computing techniques such as MPI and multi-threading to make inferences and analysis faster.
- Resulted in one first author paper submitted to Physical Review D and one co-authored paper in MNRAS

### 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.

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\*See here on how to interpret German grade: Welche Form der Benotung wird an der Uni Potsdam verwendet?

<sup>†</sup>University coursework without credits

## OBSERVING EXPERIENCE

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|---------------------------|---|
| <b>Perek 2m Telescope</b> | Assisted with 7 nights (Ondřejov, Czech Republic) |
| <b>OST 0.5m Telescope</b> | Assisted with 2 nights (Potsdam, Germany)         |

## PUBLICATIONS

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1. **Sahil Jhawar**, Thibaud Wouters, Peter T. H. Pang, et al. “A data-driven approach for modeling the temporal and spectral evolution of kilonova systematic uncertainties”. In: (Oct. 2024). Submitted to PRD. arXiv: 2410.21978 [astro-ph.HE].
2. Malina Desai, Deep Chatterjee, **Sahil Jhawar**, et al. “Kilonova Light Curve Parameter Estimation Using Likelihood-Free Inference”. In: (Aug. 2024). Submitted to MNRAS. arXiv: 2408.06947 [astro-ph.IM].
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].

## TECHNICAL PROJECTS

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### NMMA

*contributor and maintainer*

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

### GPInter

Gaussian Processes from scratch with interactive visualization.

### uptime

A Github Action and Pages based uptime monitor in Python.

### directory-cleaner

Python script to sort files into subdirectories by file type.

### git-overleaf-sync

Python script to sync Overleaf projects with Git based repository services for free version control.

## WORK EXPERIENCE

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### Deutsches GeoForschungsZentrum Potsdam (GFZ)

*July 2024 - Present*

*Student Assistant*

*Potsdam, Germany*

Deployed and maintaining quasi-real-time space-physics based machine learning model

Student Software Developer in the Section 2.7 - Space Physics and Space Weather

- Translated data assimilation algorithms from MATLAB to Python, enhancing efficiency, readability and integration with modern software practices.
- Collaborated with team members to ensure seamless implementation and testing of the translated Python-based workflows.
- Converted legacy geomagnetic model Fortran code into Python

### 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*.

- Using Python (OOP and scientific computing) to implement *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.

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

## SKILLS

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|----------------------------|---|
| <b>Technical Languages</b> | Python, C/C++, L <sup>A</sup> T <sub>E</sub> X, MATLAB  |
| <b>Technical Skills</b>    | Git (-Lab and -Hub), Unix based OS and Windows, Bayesian Inference, Data analysis and visualisation |
| <b>Packages and tools</b>  | NumPy, SciPy, Pandas, Matplotlib, Astropy, Bilby, Seaborn, Sphinx, CI/CD, Parallel computing        |

## OUTREACH AND COMMUNITY ENGAGEMENT

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**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.

**Astronomical Society of India** *February 2019*  
*Volunteer* *Bengaluru, India*

Worked with hospitality committee to cater to all needs of guests and help in the smooth running of the conference during the 37<sup>th</sup> Annual Meeting of ASI at Christ (Deemed to be University).

## CO-CURRICULAR ACTIVITIES

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### POSITIONS OF RESPONSIBILITY

**Student Coordinator of Mathematics Association, Christ**

**Student Coordinator of Sequence 2021, Christ**

**Student Coordinator of Event Horizon 2021, Christ**

**Head of Events Core Committee for Sequence 2020, Christ**

## PRIZES, AWARDS AND HONORS

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- 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