

# SAHIL JHAWAR

✉ jhavar@uni-potsdam.de ◊ [in](#) jhavarji ◊ [g](#) sahiljhavar ◊ [globe](#) sahiljhavar.me

## EDUCATION

### Universität Potsdam

Master of Science in Astrophysics  
Grade<sup>1</sup>: 1.8 (gut/good)

October 2021 - Present  
Potsdam, Germany

#### Coursework:

- Gravitational Wave Astrophysics
- General Relativity
- Multi-messenger astronomy
- Computational Astrophysics
- Bayesian Inference
- 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*

## RESEARCH EXPERIENCE

### 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* [g](#).
- Characterizing the non stationary systematic uncertainties that arise in the modeling of electromagnetic counterparts of multi-messenger source (draft PR [g](#) )
- Using parallel computing techniques such as MPI and multi-threading to make inferences and analysis faster.

### 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. Malina Desai, Deep Chatterjee, **Sahil Jhavar**, Philip Harris, Erik Katsavounidis, and Michael Coughlin. *Kilonova Light Curve Parameter Estimation Using Likelihood-Free Inference*. 2024. arXiv: 2408.06947 [astro-ph.IM]. URL: <https://arxiv.org/abs/2408.06947>.

<sup>1</sup>See here on how to interpret German grade: Welche Form der Benotung wird an der Uni Potsdam verwendet?

2. *Data driven study on kilonova modelling systematics via Bayesian analysis.* In preparation.
3. T. Hussenot-Desenonges et al. *Multi-band analyses of the bright GRB 230812B and the associated SN2023pel.* 2023. arXiv: 2310.14310 [astro-ph.HE].

## WORK EXPERIENCE

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### Deutsches GeoForschungsZentrum Potsdam (GFZ)

*July 2024 - Present*

*Student Assistant*

*Potsdam, Germany*

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

- Re-writing legacy space weather code from MATLAB to Python
- Re-writing section's data assimilation code from MATLAB and C++ to 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*.

- Participated in a 3 weeks coding campaign for the *4MOST* commissioning (November 2023)
- Collaborated with a team of 5 developers, following the Scrum agile methodology, to deliver high-quality code in short iterations, with regular feedback from stakeholders/product owner.
- Using Python (OOP and scientific computing) to implement commissioning procedures.
- 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.

## 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 help you clean your directory by rearranging the files in sub-directories as per the file kind.

### git-overleaf-sync

Python script that let's you sync your overleaf documents with GitHub/GitLab for free and efficient version control.

### cowin-vaccine

Python script to help you know the availability of vaccines around you (CoWIN).

## 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**

*Volunteer*

*February 2019*

*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).

## **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)

## **SKILLS**

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

## **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