SAHIL JHAWAR

jhawar@uni-potsdam.de ◇ jhawarji ◇ sahiljhawar ◇ sahiljhawar.in

EDUCATION

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

Coursework:

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

RESEARCH EXPERIENCE

Theoretical Astrophysics Group, Universität Potsdam *March 2023 - Present*
Master's Thesis *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 accepted in Physical Review D and one co-authored paper in MNRAS

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.

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

OBSERVING EXPERIENCE

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

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. URL: https://link.aps.org/doi/10.1103/PhysRevD.111.043046.
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

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

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

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

Deutsches GeoForschungsZentrum Potsdam (GFZ) *July 2024 - Present*
Student Assistant *Potsdam, Germany*
Student Software Developer in the Section 1.5 - Space Physics and Space Weather

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

Technical Languages	Python, C\C++, LaTeX, MATLAB
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, 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.

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^{th} Annual Meeting of ASI at Christ (Deemed to be University).

CO-CURRICULAR ACTIVITIES

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

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

Prof. Dr. Tim Dietrich
Main supervisor

tim.dietrich@uni-potsdam.de
University of Potsdam
0.082, Haus 28
14476 Potsdam
Germany

tim.dietrich@aei.mpg.de
Max-Planck-Institut für Gravitationsphysik
(Albert Einstein Institute)
1.33, Am Mühlenberg 1
14476 Potsdam
Germany

Dr. Mattia Bulla

mattia.bulla@unife.it
Department of Physics and Earth Science
University of Ferrara
Via Saragat 1, I-44122
Ferrara, Italy