

# ADAM ZACHARIA ANIL

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Indian Institute of Science Education and Research, Thiruvananthapuram  
Fourth Year BS-MS Student

## RESEARCH INTERESTS

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Gravitational-wave astrophysics, computational astrophysics, machine learning, observational Astronomy, particle physics, gamma-ray astronomy, multi-messenger astronomy

## RESEARCH EXPERIENCE

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- Daksha | Minor project** ongoing  
*IISER Thiruvananthapuram X IIT-B* India
- With Dr Shabnam Iyyani, IISER Thiruvananthapuram, in collaboration with Dr Varun Bhalerao, IIT-B
  - **Principal Investigator** - Dr Shabnam Iyyani, IISER Thiruvananthapuram
  - The ongoing project is aimed at replicating and assessing Daksha's ability to Search for thermal emissions in Gamma-Ray Burst (GRB) data from Daksha.
- Search For Kilonova | Internship** 2022  
*IISER Thiruvananthapuram* India
- With Dr Shabnam Iyyani, IISER Thiruvananthapuram
  - This research project involves me exploring uncataloged transient optical data to identify and compare its properties with the expected characteristics of Kilonova emission.
- SEDMv2 | Internship** 2023  
*University of Minnesota X Caltech* USA
- With Dr Michael Coughlin (Project Scientist SEDMv2), University of Minnesota
  - **Principal Investigator** - Shrinivas R. (Shri) Kulkarni, Caltech
  - Aid in the automated reduction / fitting pipelines which have the significant potential for being expanded to rapidly and photometrically identify specific types of transients, e.g., rare transients like kilonovae.
- Correlation Function Analysis | Internship** 2023  
*HSF-India* India
- With Dr Brij Kishor Jashal (Project Scientist) and Dr Archana Radhakrishnan , TIFR
  - **Principal Investigator** - David Lange, Princeton University
  - This project is to develop a generic software layer on top of the existing frameworks that can perform the fits and solve the system of equations to get multiple form factors from three-point correlation functions in lattice QCD.

## EDUCATION

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- IISER Thiruvananthapuram, Kerala** — Integrated MS 2020 – Present
- Major: Physics
- TKM Centenary Public School, Kerala** — Higher Secondary (Grade 12) 2020
- Percentage: 93
  - Subjects: Physics, Chemistry, Mathematics
- TKM Centenary Public School, Kerala** — Secondary (Grade 10) 2018
- GPA: 10

## ACHIEVEMENTS

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- **JEE Advanced** Rank 7963 out of 1.1 million examinees
- **Young Innovators Program** Among the 14 students selected by the Kerala Government for Young Innovators Program
- Secured the prestigious **Indian Knowledge Systems (IKS) grant** from the Central Government of India, facilitating advanced research in the domain of indigenous knowledge and its integration with contemporary practices to foster cultural preservation and sustainable development

## PROJECTS AND WORKSHOPS

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### Project - Stellar Classification

- Three person group project as part of coursework
- Classified stars into Dwarf and Giant Using ML. (f1 score 0.99)
- Used Machine Learning Classification (unsupervised and supervised), Dimensionality reduction and many other data analysis techniques on the dataset

### ZTF Summer School - Caltech

- Organised by Caltech at University of Minnesota
- hands-on sessions and interactive classes, gaining practical experience in data analysis.
- Specific training in machine learning application for astronomical data

### ICTS Summer School on Gravitational Wave Astronomy

- Interactive sessions and assignments on Stellar structure, evolution, collapse and supernovae
- Interactive sessions and assignments on Compact binary evolution, rates and population modelling

### LIGO Gravitational-wave Open Data Workshop

- Interactive sessions and assignments on Gravitational wave data analysis

## WORK AND VOLUNTEER EXPERIENCE

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### PSI(t) | *President* | 2022-Present

- Official Physics club of IISER Thiruvananthapuram
- Provided strategic leadership for the Physics Club, overseeing the planning and execution of guest lectures, workshops, study groups, and outreach programs
- Served as the main liaison between the club, university administration, and external organizations, ensuring effective representation and communication

### Exhibit A | *Chief Designer* | 2022-Present

- Official monthly science newsletter of IISER Thiruvananthapuram
- Spearheaded the design of the university's science newsletter, shaping its visual aesthetics, layout, and overall presentation to engage readers
- Collaborating closely with content creators to ensure design elements complemented and enhanced the information provided, resulting in a cohesive and appealing publication

## COMPUTER SKILLS

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### Programming

Python(NumPy, Astropy, SciPy, Pandas) | C

### Designing

Adobe InDesign | Adobe Illustrator | Adobe Photoshop

## OTHER INTERESTS

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Digital Art | Chess | Football | Pottery | Flower arrangement

## REFERENCES

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### 1. Dr. Shabnam Iyyani

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School of Physics  
IISER, Kerala, India

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### 2. Dr. Micheal Coughlin

Assistant Professor  
School of Physics and Astronomy  
MIfA, Minnesota, USA

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### 3. Dr. David Lange

Computational Physicist  
Department of Physics  
Princeton University, New Jersey ,  
USA

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