



AARAVANKIT SHAH

Course : **M.Sc.**, Physics and **B.E.**, Mathematics and Computing , 2028

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Social : [Linkedin](#) [Github](#) [Codeforces](#)

CGPA : 9.11



Technical Proficiency

Linux, Aptitude, Manim, SQLite, CI CD, NetCDF, Django, Github, Jupyter notebook, Shell Scripting, Gnuplot, Flask, Docker, API Testing, AutoCAD, Python3, Git, AIML, Postman, REST, C++ Language, MATLAB, Java

INTERNSHIPS

Research Intern, National Centre For Polar And Oceanic Research

May 2025 - Jul 2025

They maintain the **Indian Research Stations** in the **Antartic Region** while understanding and studing the **weather pattern** of India.

- Processed **~250 GB** of NetCDF **satellite data** using Python to analyse Bay of Bengal wind and ocean-current variability and model it.
- Evaluated institute-developed **linear models** on 2008–2021 satellite data to investigate discrepancies and **seasonal influence** on data.
- Authored a [Technical Report](#) documenting methodology and findings, seasonal influence on ocean level, submitted to the NCPOR library.

WORK EXPERIENCE

Undergraduate Researcher, Birla Institute of Technology and Sciences

Oct 2025 - Nov 2025

Studied and provided insights on Bikaner's location for a **Solar Farm** for an Energy Institute based on data while working under a professor.

- Built reusable **Google Colab Pipelines** to batch process monthly solar datasets into analysis-ready Excel workbooks with great insights.
- Processed **~518K** timestamped observations across **50 features** into consistent multi-resolution datasets for company analysis.
- Generated 1-, 5-, 15-, 30- and 60-minute datasets to support **Seasonal analysis of Solar Irradiance Patterns** and insights on the data.

Undergraduate Researcher, Birla Institute of Technology and Sciences

Jul 2025 - Dec 2025

To study, understand, predict and suggest policy changes regarding the **Impact of Solar Technology on Development of Rural India**.

- Analysed survey responses from **300 participants** using Python to study rural perceptions of solar energy adoption in rural India.
- Applied **PCA, Principal Axis Factoring** and **K-Means clustering** to identify and validate latent respondents into impact groups.
- Reduced 50 survey variables through correlation filtering producing a research report for [future publication](#) upon collection of more data.

PROJECTS

CPKB - Competitive Programming Knowledge Base

Jun 2026 - Present

Sole **Maintainer** of a CLI based tool that **stores snippets**, and **insert them** directly into code acting as a **library** for commonly used code.

- Built a SQLite based [CLI/TUI knowledge base](#) with **fuzzy search**, **clipboard** integration to help Competitive Programming workflows.
- Automated packaging and releases for **PyPI** and **Homebrew**, enabling **cross-platform** installation and distribution with tested code.
- Integrated a **SketchyBar** widget and **encrypted export and sync support**, extending terminal functionality with GUI-assisted access.

Media Tracker - Offline Personal Media Library

Mar 2026 - Present

A lightweight **alternative** to **Plex**. It is a web based app maintaining a **personal library of media** consumed with media tracking features.

- Built an offline [media tracker](#) supporting **Books / Movies / TV / Anime / Manga** with unified metadata & **local playback** integration.
- Designed a **lazy-loading** JSON storage model queuing **multi-API requests** to conserve memory while collecting updated metdata.
- Integrated **VLC progress tracking** and configurable media players to synchronise playback across local content and latest episodes.

AI Physics Knowledge Graph - Physics, API, AI, Learning, Educational

Dec 2025 - May 2026

An **AI** based tool to generate systematic and detailed notes on Physics topics which are interconnected and interdependent on each other.

- Built an **Ollama** pipeline that generates **Obsidian-compatible physics notes**, with **visualisation code** and expands related study topics.
- Designed a **wiki-linked** concept graph with **PageRank-based** prioritisation to guide note generation and space-review based revision.
- Implemented a human review workflow, combining AI-generated drafts with manual validation for proper maintenance and desired depth.

CFDash - CLI Codeforces Analytics Dashboard

Jun 2026 - Present

A **CLI** tool that stores user generated notes on **Codeforces** and **CSES** problems for review extracting data from the **CPOS** database.

- Extended [CPOS](#) by building a **terminal dashboard** that augments its **SQLite** database with [Codeforces note management system](#).
- Implemented **tag-based** analysis, **spaced review** & weighted **practice recommendations** for post-contest learning and improvement.
- Integrated **asynchronous data workflows** and **fuzzy search** to streamline reviewing solved problems with **GUI** support

POSITION OF RESPONSIBILITY

Student Faculty Member - Phycsics Department, BITS Pilani

Jun 2025 - Present

We act as a bridge between the students and the Faculty members, **communicating grievances** and providing suugestion to solve them.

- Represented over **75 students** on Student Faculty Committees for Physics, communicating academic feedback and grievance to faculty.
- Organised a **10-lecture** departmental series on **Quantum Perturbation Theory**, coordinating faculty and student participation.
- Consolidated and diplomatically presented **15+** student grievances, contributing to **actionable academic** and faculty improvements.