

RESEARCH INTERESTS

- Astroinformatics
- Time-Domain Astrophysics
- Data Science in Astronomy
- Supernova Cosmology

EDUCATION

Indian Institute of Science Education Research Bhopal Integrated BS-MS in Physics, CPI: 8.87*/10	Bhopal, India 2017–2022 (expected)
HSC Maharashtra Board - 12th Grade Overall: 86.0%, Computer Science: 99%	Thane, India 2017
ICSE Board - 10th Grade Overall: 95.83%, Computer Applications: 100%	Thane, India 2015

PROJECTS

Star - Galaxy - QSO Image Classification <i>Advisors: Prof. Ajit Kembhavi, Dr. Kaushal Sharma and Dr. Vivek M</i>	IUCAA, Pune August 2020 –Present
<ul style="list-style-type: none">– Exploring the use of deep convnets for photometric classification of stars, galaxies and quasars across 5 channels, with a focus on galaxies having small angular sizes (as based on their half light radius and point spread function)– Predicted photometric redshifts to use as a parameter for classification, through regression using a dense neural net– Developed a program for automated FITS retrieval, stacking, centering and cropping of SDSS objects across 5 passbands	
Photometric Classification of Simulated LSST Light Curves <i>Course Project for DSE 301: Artificial Intelligence and its Scientific Applications</i>	IISER Bhopal Feb 2020 –June 2020
<ul style="list-style-type: none">– Worked on a solution for the PLAsTiCC Challenge by implementing an ensemble of deep learning models to classify the time series data of the astronomical object– Stacked ensemble of GRU and Dense networks was trained on 7878 samples, and achieved an accuracy of 76.2% on a test set consisting of over 2.5 million samples– Report: arxiv.org/abs/2006.12333 Code Repository: github.com/siddharthchaini/Astronomical-Classification-PLASTICC	
Thermodynamic Properties of Ice - A Monte Carlo Study <i>Course Project for PHY 312: Numerical Methods and Programming</i>	IISER Bhopal May 2020 –Jun 2020
<ul style="list-style-type: none">– Implemented a Monte Carlo algorithm to calculate the residual entropy of a two-dimensional lattice model of ice at various temperatures, and identify a phase transition– Report: Click here Code Repository: github.com/siddharthchaini/ColdAsIce	
Authorship Identification <i>Course Project for HSS 322: Computational Linguistics</i>	IISER Bhopal Nov 2019
<ul style="list-style-type: none">– Implemented an algorithm to identify the author of an unknown text by analyzing the characteristic n-gram frequencies of the author, similar to K-Nearest Neighbours– Report: Click here Code Repository: github.com/siddharthchaini/AuthID	

Coupled Harmonic Oscillators and Neutrino Oscillations

IISER Bhopal

Course Project for PHY 206: Physics through Computational Thinking

April 2019

- Solved and simulated a coupled harmonic oscillator on Mathematica, and modelled neutrino oscillations by treating them as a coupled oscillator
- Mathematica nb file: [Click here](#)

Madhya Pradesh Police Project

M.P Police

Summer Project

June 2018 –Dec. 2018

- Worked with the police of Madhya Pradesh on a computer program to help catch local criminals based on their call records

POSITIONS

- **Head of the Student Research Group** at IISER Bhopal Astronomy Club August 2020–Present
In charge of data analysis - photometry and denoising
- **Teaching assistant, Lab assistant and Grader** at IISER Bhopal Spring 2019
ECS 102 – Introduction to Programming

COURSES UNDERTAKEN

Physics and Astronomy

Cosmology*, General Relativity*, Astronomy & Astrophysics, Quantum Information & Computing, Quantum Mechanics, Classical Mechanics, Statistical Mechanics, Computational Physics, Numerical Methods, Electrodynamics and Special Relativity, etc.

Mathematics

Probability and Statistics, Linear Algebra, Calculus, etc.

Other

Data Science and Machine Learning*, Artificial Intelligence, Introduction to Programming, Computational Linguistics, Atmospheric Science, Evolution of the Earth, etc.

Online Courses

[Data Driven Astronomy](#), [TensorFlow Specialisation](#), [Applied Machine Learning](#), [Algorithms by Stanford](#)

Summer/Winter School

IUCAA Astronomy Summer School 2020, MPCST - IIT I - IIA Winter School on Observational Astronomy 2021

Note: Courses marked with * will be completed by May 2021. A full list of courses can be found [here](#).

TECHNICAL SKILLS

Languages: Python, C, C++, Java, Wolfram Language, HTML, SQL, \LaTeX , Assembly Language, Bash

Software: Mathematica, SAOImage DS9

Developer Tools: Git, VS Code

Libraries: Astropy, NumPy, Keras, TensorFlow, pandas, scikit-learn, Selenium, matplotlib, qiskit

ACHIEVEMENTS AND AWARDS

Academic:

- DST Inspire Fellow
- Governor's Gold Medal awardee, Hiranandani Foundation School, Thane
- Topped in Computer Applications, ICSE Board, 2015

Sports:

- Runner-up in football at Sangharsh 2019, IISER Bhopal's Annual Sports Fest
- Runner-up in football at Hiranandani Estate's Rotary Tournament in 2012 and 2013

Other:

- Winner of Codeplay 2019, IISER Bhopal's annual hackathon
- Winner of Model Solvay Conference 2018 at IISER Bhopal - Physics