

## RESEARCH INTERESTS

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

## EDUCATION

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<b>Indian Institute of Science Education Research Bhopal</b> Integrated BS-MS in Physics, CPI: 8.94*/10	Bhopal, India 2017–2022 (expected)
<b>HSC Maharashtra Board - 12<sup>th</sup> Grade</b> Overall: 86.0%, Computer Science: 99%	Thane, India 2017
<b>ICSE Board - 10<sup>th</sup> Grade</b> Overall: 95.83%, Computer Applications: 100%	Thane, India 2015

## PROJECTS

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<b>Light Curve Feature Extraction</b> <i>Advisors: Dr. Johann-Cohen Tanugi</i>	Laboratoire de Physique de Clermont March 2021 –Present
<ul style="list-style-type: none"><li>– Working on new deep learning algorithms to extract features from light curves</li><li>– Collaborating as part of the Cosmostatistics Initiative (COIN) on the REcommendation System for SPECTroscopic follow-up (<a href="#">RESSPECT</a>)</li></ul>	
<b>Star - Galaxy - QSO Image Classification</b> <i>Advisors: Prof. Ajit Kembhavi, Dr. Kaushal Sharma and Dr. Vivek M</i>	IUCAA, Pune Aug. 2020 –Feb. 2021
<ul style="list-style-type: none"><li>– Used machine learning for photometric classification of compact images from the Sloan Digital Sky Survey as galaxies, stars or quasars on the basis of their images in five observational bands</li><li>– Combined deep convnets along with traditional machine learning algorithms</li><li>– Developed a program for automated FITS retrieval, stacking, centering and cropping of SDSS objects across 5 passbands</li></ul>	
<b>Photometric Classification of Simulated LSST Light Curves</b> <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"><li>– Worked on a solution for the <a href="#">PLAsTiCC Challenge</a> by implementing an ensemble of deep learning models to classify the time series data of the astronomical object</li><li>– 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</li><li>– Report: <a href="https://arxiv.org/abs/2006.12333">arxiv.org/abs/2006.12333</a> Code Repository: <a href="https://github.com/siddharthchaini/Astronomical-Classification-PLASTICC">github.com/siddharthchaini/Astronomical-Classification-PLASTICC</a></li></ul>	
<b>Thermodynamic Properties of Ice - A Monte Carlo Study</b> <i>Course Project for PHY 312: Numerical Methods and Programming</i>	IISER Bhopal May 2020 –June 2020
<ul style="list-style-type: none"><li>– 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</li><li>– Report: <a href="#">Click here</a> Code Repository: <a href="https://github.com/siddharthchaini/ColdAsIce">github.com/siddharthchaini/ColdAsIce</a></li></ul>	
<b>Authorship Identification</b> <i>Course Project for HSS 322: Computational Linguistics</i>	IISER Bhopal Nov. 2019

- 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](https://github.com/siddharthchaini/AuthID)

## POSITIONS

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- **Head of the Student Research Group** at IISER Bhopal Astronomy Club Aug. 2020 – Present  
*In charge of data analysis - image reduction and photometry*
- **Teaching assistant, Lab assistant and Grader** at IISER Bhopal Jan. 2019 – May 2019  
*ECS 102 – Introduction to Programming*

## RELEVANT COURSES

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### 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.

### Summer School

[Summer School in Statistics for Astronomers](#)

### Online Courses

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

Note: These are only a subset of all courses. A full list of courses with their certificates and gradesheets can be found [here](#).

## TECHNICAL SKILLS

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**Languages:** Python, C, C++, Java, Wolfram Language, HTML, SQL,  $\text{\LaTeX}$ , 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

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### 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