**Parth Sastry**
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Engineering Physics
Indian Institute of Technology Bombay

**180260026**
UG Third Year

| Examination | University | Institute | Year | CPI/% |
|---|---|---|---|---|
| Graduation | IIT Bombay | IIT Bombay | 2022 | 9.43 |
| Intermediate/+2 | CBSE | Delhi Public School, Bopal | 2018 | 94.00 |
| Matriculation | CBSE | Delhi Public School, Bopal | 2016 | 10.0 |

*Pursuing Honors in Physics and a Minor in Computer Science*

## academic achievements

### Joint Entrance Examination                                           2018
- Secured an All India Rank of 145 in Joint Entrance Examination (Advanced) among 230,000 aspirants
- Secured an All India Rank of 1473 in JEE (Mains) among 1.04 million aspirants

### Indian National Astronomy Olympiad and OCSC                          2017
- Was selected for the **Orientation-cum-Selection camp in Astronomy** as **one among 30**, on the basis of my performance in the INAO-2017.
- In the OCSC, was **among the top 5**, selected to represent India at the **IOAA-2017**
- At the OCSC, given a **Special Merit Award** for the **Best solution to a Data Analysis Question**, for my solution to a Light-Curve problem.

### International Olympiad of Astronomy and Astrophysics                  2017
- **Represented India at the IOAA-2017**, held in Thailand as one among five.
- Given the **Honorable Mention Award** at the IOAA-2017, with a final score of 315.30, or 60.99% out of the maximum

## experience

### Modelling Movement of Animals as Continuous Fluid Flow          Mar'20-current
Under Prof. Manikandan Mathur, IIT Madras
*Research Project*
- Currently working on modelling movement of discrete animals in a collective herd as a fluid flow
- Working on adapting random walk models with reinforcement and memory to a continuous flow model

### Internship at EXL Service                                         Jun-Jul'20
Data Analyst, Decision Analytics Team
*Internship*
- Built loan default prediction models based on borrower information from a peer-to-peer lending platform (LendingClub)
- Implemented binary classification models on **Logistic Regression, Decision Tree, Random Forest and Gradient Boosting algorithms;** evaluated classifier performances on the metrics of AUROC and Lift Curve
- Managed implementations on **statsmodels, scikit-learn and pandas;** achieved a best case accuracy of 83%
- Learnt about Deep Learning Algorithms like **Recurrent Neural Networks and Multilayer Perceptron Neural Networks,** used in this particular problem.

# projects

## Fluid Flows and Lagrangian Coherent Structures <span style="float:right">Jul'19-nov'19</span>

Advisor: Prof. Punit Parmananda, Department of Physics, IIT Bombay

*Course Project*

- ✠ Looked at and made some models and simulations for fluid flows, and understood the idea of **Lagrangian Coherent Structures**

- ✠ Presented as part of our Honors class, on the topic, and studied about the **various types and ways to model LCSs**

- ✠ Looked at **examples of LCSs and their structure**, as seen on various planets in our Solar System

- ✠ Studied about ways to obtain data for modeling, and **used sample datasets to make model simulations of fluid flow and evolution of LCSs**

## Black Hole Information Paradox <span style="float:right">May'19-Jul'19</span>

Advisor: Prof. S. Mohanty, Physical Research Laboratory, Ahmedabad

*Supervised Reading*

- ✠ Studied about the **Black Hole Information Paradox** and about the modern approach to the Paradox proposed by Stephen Hawking

- ✠ Learned about associated concepts like **Quantum Field Theory, General Relativity, and Penrose Diagrams**

- ✠ Learned about modern resolutions to the paradox, like the **Black Hole Firewall, and the Fuzzball**

- ✠ Built a background to understand and look at the problem and associated problems through the lens of String Theory and Quantum Electrodynamics

## Digital Stopwatch <span style="float:right">Feb'2019-Apr'19</span>

Advisor: Prof. Mahesh B. Patil, Department of Electrical Engineering, IIT Bombay

*Course Project*

- ✠ Alongside two others, built a **functioning stopwatch with a start/stop/reset functionality** capable of measuring time with a precision of one second up to one hour

- ✠ Utilized **IC555 timers, and IC7041 decade counters**, with BCD to 7-Segment displays to design our circuit

- ✠ Enabled the resetting of the minutes display, allowing us to extend our circuit design to have hour display

# key courses

|  |  |
|---|---|
| Physics | Fluid Dynamics‡, Non-Linear Dynamics, General Theory of Relativity, Quantum Mechanics 1, Quantum Mechanics 2 ‡, Astrophysics*, Photonics ‡, Electromagnetism, Special Theory of Relativity, Classical Mechanics, Thermal Physics |
| Mathematics | Calculus, Linear Algebra, Ordinary and Partial Differential Equations, Complex Analysis, Introduction to Numerical Analysis |
| Computer Science | Logic for Computer Science, Automated Reasoning ‡, Digital Image Processing‡, Data Structures and Algorithms, Design and Analysis of Algorithms‡ |
| Others | Analog Electronics, Analog Electronics Lab, Digital Electronics Lab, Microprocessor Lab ‡, Data Analysis and Interpretation |

‡. To be completed by November 2020

*. Plan on taking next semester

## technical skills

| | |
|---:|:---|
| Languages | English (fluent), Hindi (native), Latin[‡] (read/write) |
| Programming | C++, C, Python, MATLAB, Octave, Julia[‡] |
| Data Science | Pandas, NumPy, scikit-learn, Statsmodels, Theano, SQL |
| Machine Learning & AI | TensorFlow, Keras, PyTorch |
| Computer Aided Drawing | AutoCAD, Solidworks |
| Other Software | LaTeX |

‡. In progress

## hobbies and interests

**Origami -** paper folding. Been following YouTuber Jo Nakashima's channel ever since it began

**Playing the Guitar -** never took formal lessons, learn by creating tabs for songs I like, and learning how to play tunes found on the internet

**Reading Fiction -** read fantasy, mostly. Also a big fan of Historical Fiction, and Hard Science Fiction

**Music Composition -** Completed a Music Theory Course on Coursera, taken by the University of Edinburgh (Fundamentals of Music Theory)

## extracurricular achievements

Football (Soccer)

- ⚔ Part of the first fresher team to have reached the finals, and won a **silver medal,** in the Inter-Hostel Football General Championship, IIT Bombay                                                                    2018

- ⚔ Represented IIT Bombay in Udghosh (2019), sports festival organised by IIT-Kanpur                          2019

- ⚔ Represented IITB (IITB-A) in District Level Club Competition (MDFA-Second Division)                    2019-20

- ⚔ **Silver Medallist** in the Institute Football League Cup, IIT Bombay                                            2019

- ⚔ Adjudged **'Emerging Player'** at the Institute Football League, IIT Bombay

  2019

MUNs

- ⚔ Participated in the IIMUN Chapter as a Delegate in the UNHRC

  2015