Yash Mehta

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EDUCATION

INDIAN INSTITUTE OF SCIENCE
MS in Physics
With **Distinction**
Jul 2022 | Bengaluru
CGPA: 8.8 / 10.0

BS in Physics
With **Distinction**
Jul 2021 | Bengaluru
CGPA: 8.9 / 10.0

COURSEWORK

COMPUTER SCIENCE
Design and Analysis of Algorithms
ML + Signal Processing
Programming and Algorithms
Computational Physics
Numerical Differential Equations

MATHEMATICS
Introduction to Analysis
Introduction to Linear Algebra
Probability + Statistics
Mathematical Methods of Physics

PROJECTS

Two Player Chess
YruRU and Mehta Websites
Path-Finding Visualiser
Sorting Visualiser
Space Invaders
Online Hand Cricket

SKILLS

PROGRAMMING
Fluent
Python • JavaScript • C • C++
HTML • CSS • Julia • LaTeX
Familiar
FORTRAN • MATLAB • Flask
React.JS • Assembly • SQL

CLUBS AND TEAMS
Athletics • Dramatics • Music
Speed-Cubing • Judo • Debate

MISCELLANEOUS
Rubik's Cube **World Record**
Top Rank on Codewars
Tabla Visharad

RESEARCH EXPERIENCE

INDIAN INSTITUTE OF SCIENCE | Bengaluru
Jul 2021 - Present | Advisor: Prof. Prateek Sharma

- **Analysed data** from the IllustrisTNG suite of simulations (∼**1 Petabyte**) and used it to verify various cosmological predictions (eg. self-similarity in dark matter halos).
- Developed a model for infalling gas clouds and implemented a **segmentation algorithm** on Voronoi tesellation to identify such clouds from the dataset to verify the model.

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH | Mohali
Dec 2020 – Jun 2021 | Advisor: Prof. Jasjeet Bagla

- Developed a semi-analytical model based on Dutta et. al 2019 to **simulate** Bondi-Hoyle accretion and evolution of protostars and their trajectories in primordial gas clumps.
- **Extended the original simulation** to include effects of radiation on accretion.

TATA INSTITUTE FOR FUNDAMENTAL RESEARCH | Mumbai
Dec 2018 – Dec 2019 | Advisor: Prof. Sourav Chatterjee

- **Modified the code** of COSMIC-popsynth to generate and evolve binary star systems.
- Developed an assembly of codes to **simulate** a globular cluster's tidal potential on the binary star systems generated by the modified COSMIC-popsynth.

MENTORING EXPERIENCE

CALTECH CODE/ASTRO WORKSHOPS | Caltech, Pasadena
2021 - Present | Role: Teaching Assistant

- Mentored **5 groups of 2-4 participants** on fundamental **software engineering skills** and best practices for **building sustainable open-source packages.**

IOAA SELECTION AND TRAINING CAMPS | HBCSE, Mumbai
2018 - Present | Role: Student Facilitator

- Mentored a **cumulative** ∼**150 country-wide top high school students** at the Orientation-Cum-Selection-Camp (OCSC) to select and train the **national team** for the International Olympiad on Astronomy and Astrophysics (IOAA).

ACADEMIC AWARDS

2018	Top 30 / 10K+	National Initiative on Undergraduate Science (NIUS) Fellow
2018, 2019	Top 15 / 1000+	Madhava Mathematics Competition Merit List (2x)
2017	493rd / 1.2M+	Joint Entrance Examination
2016	**Int'l. Olympiad**	**Silver Medalist at IOAA**
2016	1st / 50K+	"Best Data Analyst" at IOAA OCSC
2016	42nd / 100K+	Kishore Vaigyanik Protashan Yojana (KVPY) Fellow
2015-2017	Top 250 / 50K+	INMO (2x), INAO (2x), INPhO and INChO Finalist
2015, 2016	**1st / 100K+**	**Technothlon Winner (2x)**
2009, 2013	1st / 100K+	SOF Maths Olympiad Winner (2x)

PUBLICATIONS

1. **Y. Mehta**, A. Dutta, P. Sharma, D. Nelson, "Hot N Cold Gas: Self-Similar Scaling of the Hot CGM and Cloud Properties in Illustris-TNG Halos"
2. **Y. Mehta**, J. Bagla, "Radiative Effects During Primordial Star Formation on Survival of Population III Stars Till Present Day"

The current versions of above papers can be found here: https://rb.gy/sbodpy.