

Gaurav Waratkar

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I am interested primarily in Astronomical Instrumentation and Multi-Wavelength follow-up of high-energy transients like Gamma-Ray Bursts (GRBs), Fast Radio Bursts (FRBs) & Gravitational Wave (GW) sources.

Education

- Indian Institute of Technology Bombay** **Mumbai, MH**
 - Graduate Student at STAR Lab, Department of Physics 2020 - Present
 - Guide:** Prof. Varun Bhalerao
 - Topics:** Daksha Instrumentation (New proposed X-ray Space Telescope)
EM Follow-up of Fast Transients using CZTI payload onboard AstroSat
Understanding noise characteristics of CZTI.
- Indian Institute of Technology Bombay** **Mumbai, MH**
 - Bachelor's in Technology, Mechanical Engineering Department 2015 - 2019

Talks, Conferences and Schools

- 39th meeting of the Astronomical Society of India**
 - *Talk: The Search for Fast Transients with AstroSat-CZTI* Feb 2021
- Conference on 5 years of AstroSat**
 - *Poster presentation: Searching for Transients using AstroSat CZTI* Jan 2021
- GROWTH Annual Conference 2018**
 - *Poster presentation: Satellite visibility orbital simulator* Dec 2018
- GROWTH Winter school 2018**
 - *Tutor, module testing & organizing the winter school* Dec 2018

Publications

3. Sharma, Y., . . . , **G. Waratkar**, . . . et al. "The Search for Fast Transients with CZTI", Journal of Astrophysics and Astronomy, [arXiv:2011.07067](https://arxiv.org/abs/2011.07067) (Jan 2020).
2. Kasliwal, Mansi M., . . . , **G. Waratkar**, . . . et al. "Kilonova Luminosity Function Constraints Based on Zwicky Transient Facility Searches for 13 Neutron Star Merger Triggers during O3", The Astrophysical Journal, [10.3847/1538-4357/abc335](https://doi.org/10.3847/1538-4357/abc335) (Dec 2020). **Cited: 17**
1. Coughlin, Michael W., . . . , **G. Waratkar**, . . . et al. "GROWTH on GW190425: Searching thousands of square degrees to identify an optical or infrared counterpart to a binary neutron star merger with the Zwicky Transient Facility and Palomar Gattini IR", The Astrophysical Journal, [10.3847/2041-8213/ab4ad8](https://doi.org/10.3847/2041-8213/ab4ad8) (Oct 2019). **Cited: 41**

Non-Refereed.....

[Checkout on ADS](#)

Experience

- Department of Physics, IIT Bombay Mumbai, MH
 - Project Research Assistant May 2019 - Dec 2019
 - Advisors: Prof. Varun Bhalerao, Prof. Salil Kulkarni, Prof. Deepak Marla, Prof. PJ Guruprasad, Prof. Rakesh Mote
 - Performed Daksha orbital heating tests, modal and static structural simulations with NX Nastran and Ansys (incorporating integration and mission costs) to ensure satellite robustness and consistency with mission goals
 - Mentored 12 undergraduate students on multiple projects related to the mission over the tenure
- National Centre for Radio Astrophysics Pune, MH
 - Visiting Students Research Program May 2018 - Oct 2019
 - Advisor: Prof. Yashwant Gupta, Director, NCRA-TIFR

Undergraduate Research and Technical Projects

- EMGW Follow-up using GROWTH-India Telescope
 - Advisor: Prof. Varun Bhalerao, Physics Department, IIT Bombay Jan 2019 - July 2019
- Transient visibility from a satellite - A python simulator
 - Advisor: Prof. Varun Bhalerao, Physics Department, IIT Bombay July 2017 - April 2018
- Simulations on Core vs Cusp density problem of Dark Matter
 - Advisor: Prof. D Narasimha, Department of Astronomy and Astrophysics, TIFR Summers 2017
- IIT Bombay Racing (Powertrain Subsystem)
 - Junior Design Engineer, Mechanical Department, IIT Bombay Sept 2016 - April 2017

Outreach

- TechFest - Krittika Astrophysics Workshop
 - Module and Session lead Dec 2020
 - Tutored ~100 students with the basics of Optical Image reduction, subtraction using the data from GROWTH-India Telescope oriented towards time-domain astronomy and EM followup of GW sources
- A talk on Astronomical Telescopes
 - Krittika - Lecture Series on Observational Astronomy Sept 2020
- Talk on Basics of Pulsars & their detection in radio data
 - Krittika Lecture Series Oct 2018
- Manager and Convener
 - Krittika – The Astronomy Club of IIT Bombay 2016 - 2018
 - Received two 6" equatorial Telescopes worth over INR 80,000 as a token of appreciation from HBCSE
 - Conducted first ever outreach session for school students from slums around the institute & from Kashmir
 - Doubled the club's social media reach in 2 years helped by highly successful trips to MAST & IRO, Mt. Abu
 - Planned a budget of over 0.4 million INR for club activities including lectures, documentary screenings, night sky observations, telescope handling workshops, quizzes & field trips to GMRT & Nehru Planetarium, Mumbai.

Scholastic Achievements

- Secured an **AP grade** in Machine Design course for exceptional performance | Given to 2 out of 160 students
- Qualified IUCAA's PhD entrance exam INAT's written test by being in **Top 38** out of over 800 candidates
- Secured a **National Rank of 89** in JEST, Physics PhD entrance exam organised by TIFR, Mumbai
- Secured a **99.75 percentile** in JEE Mains 2015 in over 1.3 million students
- Qualified for the **Indian National Astronomy Olympiad** for being in **top 300 in the country**
- Awarded the National Talent Search (NTS) Scholarship given by NCERT Delhi, **Government of India**

- o Awarded '**Best Outgoing Student**' from 122 students for being best overall performer over 10 years

Extracurricular Activities

- Awarded 'Best Cadet' in National Cadet Corps (NCC) - Air Wing among 400 cadets
- Represented Hostel 7 in Volleyball in General Championships 2015, secured 2nd Place among 14 hostels
- Participated in multiple Kho-Kho and Roller-Skating Tournaments, intra-hostel Football League