

Gaurav Waratkar

Department of Physics, IIT Bombay - Mumbai - India

☎ +91-9405971764 • ✉ gauravwaratkar@iitb.ac.in
🌐 <http://home.iitb.ac.in/~gauravwaratkar>

I am primarily interested in Astronomical Instrumentation and studying 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

- **GW-EM-Nu-2023: Role of India in Multi-Messenger Astrophysics** **TIFR Mumbai, India**
Poster: Sifting for counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI *Nov 2023*
- **Asia-Pacific Regional IAU Meeting (APRIM 2023)** **Koriyama, Japan**
Talk: Sifting for EM counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI *Jul 2023*
- **15th Edoardo Amaldi Conference on Gravitational Waves** **Online**
Talk: Sifting for EM counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI *Jul 2023*
- **LIGO-India Science Meeting** **IUCAA Pune, India**
Talk: Implications of LIGO-India on EM Follow-up: Indian & International EM community *May 2023*
- **Young Astronomers' Meet 2022** **ARIES Nainital, India**
Talk: CIFTing for LIGO-Virgo triggers in AstroSat CZTI *Nov 2022*
- **40th meeting of the Astronomical Society of India** **IIT Roorkee, India**
Poster: Daksha: Structural design and simulations of the payload *Mar 2022*
- **39th meeting of the Astronomical Society of India** **Online**
Talk: The Search for Fast Transients with AstroSat-CZTI *Feb 2021*
- **Conference on 5 years of AstroSat** **ISRO Bangalore, India**
Poster presentation: Searching for Transients using AstroSat CZTI *Jan 2021*
- **GROWTH Annual Conference 2018** **IIT Bombay, India**
Poster presentation: Satellite visibility orbital simulator *Dec 2018*
- **GROWTH Winter school 2018** **IIT Bombay, India**
Tutor, module testing & organizing the winter school *Dec 2018*

Publications

Check out this list of my publications of refereed journal papers — [here on ADS](#).

7. Bala, S., Mate, S., Mehla, A., ..., **G. Waratkar**, ..., et al. (2023), Journal of Astronomical Telescopes, Instruments, and Systems, *Prospects of measuring gamma-ray burst polarization with the Daksha mission*, 9, 048002.
6. Singhal, A., Palit, S., Bala, S., ..., **G. Waratkar**, ..., et al. (2022), Journal of Astrophysics and Astronomy, *Gravitational waves and electromagnetic transients*, 43, 53.
5. Kumar, H., Bhalerao, V., Anupama, G. C., ..., **G. Waratkar**, ..., et al. (2022), Monthly Notices of the Royal Astronomical Society, *GROWTH on S190426c II: GROWTH-India Telescope search for an optical counterpart with a custom image reduction and candidate vetting pipeline*, 516, 4517.
4. Kumar, H., Bhalerao, V., Anupama, G. C., ..., **G. Waratkar**, ..., et al. (2022), The Astronomical Journal, *India's First Robotic Eye for Time-domain Astrophysics: The GROWTH-India Telescope*, 164, 90.
3. Sharma, Y., Marathe, A., Bhalerao, V., ..., **G. Waratkar**, ..., et al. (2021), Journal of Astrophysics and Astronomy, *The search for fast transients with CZTI*, 42, 73.
2. Kasliwal, M. M., Anand, S., Ahumada, T., ..., **G. Waratkar**, ..., et al. (2020), The Astrophysical Journal, *Kilonova Luminosity Function Constraints Based on Zwicky Transient Facility Searches for 13 Neutron Star Merger Triggers during O3*, 905, 145.
1. Coughlin, M. W., Ahumada, T., Anand, S., ..., **G. Waratkar**, ..., et al. (2019), The Astrophysical Journal, *GROWTH on S190425z: 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*, 885, L19.

Non-Refereed.....

The entire list of my non-refereed publications including GCNs, Atels, TNS circulars, and others — [here on ADS](#).

Press Releases.....

- **India's Astrosat captures 600th mega explosion that rocked the universe** **Nov 2023**
◦ [AstroSat-CZTI's detection of 600th Gamma-Ray Burst](#)
- **India's AstroSat witnesses black hole birth for the 500th time** **May 2022**
◦ [AstroSat-CZTI's detection of 500th Gamma-Ray Burst](#)

Teaching and Mentored Projects

Teaching roles:

- Teaching Assistant - PH 119 (Physics Lab) Spring 2024
- Teaching Assistant - PH 119 (Physics Lab) Autumn 2023
- Teaching Assistant - PH 119 (Physics Lab) Spring 2023
- Teaching Assistant - PH 119 (Physics Lab) Autumn 2022
- Teaching Assistant - PH 556 (Astrophysics) Spring 2021

Mentoring roles:

- Mentored research projects of over **38 Undergraduate Students**
- Mentoring the setting up of an amateur observatory inside IIT Bombay campus

Experience

- **Department of Physics, IIT Bombay** **Mumbai, MH**
◦ *Project Research Assistant* *May 2019 - Dec 2019*
Project title: Mechanical design and testing of Daksha - proposed mission to ISRO.
Advisors: [Prof. Varun Bhalerao](#), [Prof. Salil Kulkarni](#), [Prof. Deepak Marla](#), [Prof. PJ Guruprasad](#), [Prof. Rakesh Mote](#)
- **National Centre for Radio Astrophysics** **Pune, MH**
◦ *Visiting Students Research Program* *May 2018 - Oct 2019*
Project title: PuGMark: Blind pulsar searches with uGMRT
Advisor: [Prof. Yashwant Gupta](#), Director, NCRA-TIFR

Position of Responsibility

- **Club Convener, Astro-Cosmo-Gravity Journal Club**
Physics Department 2022-2023
- **Institute coordinator, Codetantra IIT Bombay**
Codetantra: B2B (SaaS) EduTech StartUp 2021-2022
- **Manager**
Krittika – The Astronomy Club of IIT Bombay 2017 - 2018
- **Convener**
Krittika – The Astronomy Club of IIT Bombay 2016 - 2017

Outreach

- **Technovanza - LIGO-India and GW Detectors**
Booth Coordinator: Technovanza at VJTI Mumbai Jan 2024
- **Techfest - Daksha: Indian Eyes on Transient Skies**
Booth: TechConnect at TechFest IIT Bombay Dec 2023
- **Cosmic Exotic Marvels - A journey to the heaviest objects in the universe**
Invited Guest Talk: Pawar International School, Mumbai Oct 2023
- **Technovanza - LIGO-India and GW Detectors**
Booth Coordinator: Technovanza at VJTI Mumbai Jan 2023
- **Astronomers for Planet Earth Symposium 2022**
LOC Team Member as a part of A4E Dec 2022
- **Techfest - Daksha: Indian Eyes on Transient Skies**
Booth: TechConnect at TechFest IIT Bombay Dec 2022
- **TechFest - Krittika Astrophysics Workshop**
Module and Session lead Dec 2020
- **A talk on Astronomical Telescopes**
Krittika - Lecture Series on Observational Astronomy Sept 2020
- **Techfest - LIGO-India and LIGO GW Detectors**
Booth: TechConnect at TechFest IIT Bombay Dec 2019
- **Techfest - LIGO-India and LIGO GW Detectors**
Booth: TechConnect at TechFest IIT Bombay Dec 2018
- **Techfest - LIGO-India and LIGO GW Detectors**
Booth: TechConnect at TechFest IIT Bombay Dec 2017
- **Talk on Basics of Pulsars & their detection in radio data**
Krittika Lecture Series Oct 2018

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

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**
- 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