

# Gaurav Waratkar

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I am primarily interested in studying relativistic fast-transients like Gamma-Ray Bursts (GRBs), Fast Radio Bursts (FRBs) & Gravitational Wave (GW) sources and building instruments to study these sources better.

## Education

- Indian Institute of Technology Bombay** **Mumbai, MH**
  - Graduate Student at STAR Lab, Department of Physics 2020 - Present
  - Guide:** Varun Bhalerao
  - Topics:** Daksha Mechanical Instrumentation, EM Follow-up of Fast Transients using AstroSat-CZTI  
Low-latency RAVEN searches of joint GW-GRB events.
- Indian Institute of Technology Bombay** **Mumbai, MH**
  - Bachelor's in Technology, Mechanical Engineering 2015 - 2019

## Talks, Conferences and Schools

- LIGO Livingston Observatory Seminar** **LLO, Louisiana, USA**
  - Talk: Chasing Counterparts: LVK Low-Latency data products, coincidences, and future Oct 2024
- TDAMM 2024: The Third Time-Domain and Multi-Messenger workshop** **LSU, Louisiana, USA**
  - Poster: Daksha: On alert for high-energy transients Sep 2024
- TDA Group - Cahill Center for Astronomy and Astrophysics** **Caltech, California, USA**
  - Talk: Chasing high-energy transients with AstroSat & Daksha Sep 2024
- Caltech PMA LIGO Laboratory Seminar** **Caltech, California, USA**
  - Talk: Chasing Counterparts: Low-Latency data products, coincidences, and future Sep 2024
- University of California Berkeley - Space Sciences Lab Seminar** **UCB-SSL, California, USA**
  - Talk: Chasing High-Energy Transients with Daksha Sep 2024
- Louisiana State University - Astrophysics Lunch Seminar** **LSU, Louisiana, USA**
  - Talk: Daksha: On alert for high-energy transients Sep 2024
- Transients 2024** **IIT Bombay, India**
  - Talk: Rapid searches for fast-transients using AstroSat-CZTI Apr 2024
- 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: Searching for Transients using AstroSat CZTI Jan 2021

- **GROWTH Annual Conference 2018**
- *Poster: Satellite visibility orbital simulator*

**IIT Bombay, India**  
Dec 2018

## Publications & Press Releases

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Check out all my publications – including **25 Journal papers** and **~ 275 GCNs**, Atels, TNS circulars – [here on ADS](#).

### Press Releases

- **Researchers advance detection of gravitational waves to study collisions of black holes** **Apr 2024**  
*Low-Latency data products of gravitational wave mergers*
- **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*

## Fellowships, Observing Experience

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- **LIGO Livingston Observatory** **Louisiana, USA**  
*LSC Fellow* *Jul 2024 - Oct 2024*  
Project title: Joint GW-GRB searches with RAVEN & building, testing seismometers for seismic isolation  
Advisor: Brian O'Reilly, Huyen Pham, LIGO Livingston Observatory
- **Chandra ToO Proposal: Accepted**  
*Observing GRB 230812B - To understand Jet Physics for an Extremely Bright GRB* *Aug 2023*
- **AstroSat ToO Proposal: Accepted**  
*Observation of GRB220408A - Possible nearest known GRB ever* *Apr 2022*
- **GROWTH-India Telescope Observing**  
*Several weeks of full night observations* *2019*
- **Upgraded Giant Meterwave Radio Telescope Observing**  
*Several epochs of Pulsar search survey observations* *2018*

## Teaching and Mentoring

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- Mentored research projects of over **27 Undergraduate Students**
- Mentoring the setting up of an amateur observatory inside IIT Bombay campus
- **7th Gravitational Wave Open Data workshop 2024**  
*Mentor: Offline Study hub at IIT Bombay for 30 students* *May 2024*
- **Daksha Workshop at 42nd Meeting of ASI**  
*Section lead: Hands-on tutorial on creating Daksha mock data and detecting GRBs* *Feb 2024*
- **6th Gravitational Wave Open Data workshop 2023**  
*Mentor: Offline Study hub at IIT Bombay for 30 students* *May 2023*
- **GROWTH Winter school 2018**  
*Tutor, module testing & organizing the winter school* *Dec 2018*
- Teaching Assistant - PH 119 (Physics Lab) - Autumn 2022 till Spring 2024
- Teaching Assistant - PH 556 (Astrophysics) - Spring 2021
- Teaching Assistant - PH 556 (Astrophysics) - Spring 2020

## Position of Responsibility

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

## Outreach

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- **Daksha Socials: Instagram, X (Formerly Twitter), Facebook**  
*Social Media Lead* 2022-2025
- **Panel Member - Careers in Astrophysics**  
*Krittika - The Astronomy Club of IIT Bombay* Sep 2024
- **Techfest - Daksha: Indian Eyes on Transient Skies**  
*Booth Coordinator: TechConnect at TechFest IIT Bombay* 2022 - 2024
- **Techfest - LIGO-India and LIGO GW Detectors**  
*Booth: TechConnect at TechFest IIT Bombay* 2017 - 2024
- **Technovanza - LIGO-India and GW Detectors**  
*Booth Coordinator: Technovanza at VJTI Mumbai* 2023 - 2024
- **Invited talk: Astrophysics Adventures - AstroSat, LIGO-India & Beyond**  
*ZetaGravity's X-Space* Mar 2024
- **Cosmic Exotic Marvels - A journey to the heaviest objects in the universe**  
*Invited Guest Talk: Pawar International School, Mumbai* Oct 2023
- **Astronomers for Planet Earth International Symposium 2022**  
*LOC Team Member as a part of A4E* Dec 2022
- **TechFest - Krittika Astrophysics Workshop**  
*Module and Session lead* Dec 2020
- **Basics of 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

## Pre-PhD Research and Technical Experience

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- **Department of Physics, IIT Bombay**  
*Project Research Assistant: Mechanical design and testing of Daksha* May 2019 - Dec 2019
- **National Centre for Radio Astrophysics**  
*Visiting Students Research Program: PuGMark: Blind pulsar searches with uGMRT* May 2018 - Oct 2019
- **Transient visibility from a satellite - A python simulator**  
*Advisor: Varun Bhalerao, Physics Department, IIT Bombay* July 2017 - April 2018
- **Simulations on Core vs Cusp density problem of Dark Matter**  
*Advisor: 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

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- 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

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- Climate change activities - Powai Lake clean-up, publicizing the COP26 global efforts in Mumbai
- 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