

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

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| ○ Indian Institute of Technology Bombay
<i>Graduate Student at STAR Lab, Department of Physics</i> | Mumbai, MH
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
<i>Bachelor's in Technology, Mechanical Engineering</i> | Mumbai, MH
2015 - 2019 |

Talks, Conferences and Schools

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| ○ LIGO Livingston Observatory Seminar | LLO, Louisiana, USA
Oct 2024 |
| Talk: Chasing Counterparts: LVK Low-Latency data products, coincidences, and future | |
| ○ TDAMM 2024: The Third Time-Domain and Multi-Messenger workshop | LSU, Louisiana, USA
Sep 2024 |
| Poster: Daksha: On alert for high-energy transients | |
| ○ TDA Group - Cahill Center for Astronomy and Astrophysics | Caltech, California, USA
Sep 2024 |
| Talk: Chasing high-energy transients with AstroSat & Daksha | |
| ○ Caltech PMA LIGO Laboratory Seminar | Caltech, California, USA
Sep 2024 |
| Talk: Chasing Counterparts: Low-Latency data products, coincidences, and future | |
| ○ University of California Berkeley - Space Sciences Lab Seminar | UCB-SSL, California, USA
Sep 2024 |
| Talk: Chasing High-Energy Transients with Daksha | |
| ○ Louisiana State University - Astrophysics Lunch Seminar | LSU, Louisiana, USA
Sep 2024 |
| Talk: Daksha: On alert for high-energy transients | |
| ○ Transients 2024 | IIT Bombay, India
Apr 2024 |
| Talk: Rapid searches for fast-transients using AstroSat-CZTI | |
| ○ GW-EM-Nu-2023: Role of India in Multi-Messenger Astrophysics | TIFR Mumbai, India
Nov 2023 |
| Poster: Sifting for counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI | |
| ○ Asia-Pacific Regional IAU Meeting (APRIM 2023) | Koriyama, Japan
Jul 2023 |
| Talk: Sifting for EM counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI | |
| ○ 15th Edoardo Amaldi Conference on Gravitational Waves | Online
Jul 2023 |
| Talk: Sifting for EM counterparts to LIGO-Virgo-KAGRA GW triggers using AstroSat-CZTI | |
| ○ LIGO-India Science Meeting | IUCAA Pune, India
May 2023 |
| Talk: Implications of LIGO-India on EM Follow-up: Indian & International EM community | |
| ○ Young Astronomers' Meet 2022 | ARIES Nainital, India
Nov 2022 |
| Talk: CIFTing for LIGO-Virgo triggers in AstroSat CZTI | |
| ○ 40th meeting of the Astronomical Society of India | IIT Roorkee, India
Mar 2022 |
| Poster: Daksha: Structural design and simulations of the payload | |
| ○ 39th meeting of the Astronomical Society of India | Online
Feb 2021 |
| Talk: The Search for Fast Transients with AstroSat-CZTI | |
| ○ Conference on 5 years of AstroSat | ISRO Bangalore, India
Jan 2021 |
| Poster: Searching for Transients using AstroSat CZTI | |

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

IIT Bombay, India
Dec 2018

Publications & Press Releases

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

- **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** Aug 2023
- *Observing GRB 230812B - To understand Jet Physics for an Extremely Bright GRB*
- **AstroSat ToO Proposal: Accepted** Apr 2022
- *Observation of GRB220408A - Possible nearest known GRB ever*
- **GROWTH-India Telescope Observing** 2019
- *Several weeks of full night observations*
- **Upgraded Giant Meterwave Radio Telescope Observing** 2018
- *Several epochs of Pulsar search survey observations*

Teaching and Mentoring

- 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** May 2024
- *Mentor: Offline Study hub at IIT Bombay for 30 students*
- **Daksha Workshop at 42nd Meeting of ASI** Feb 2024
- *Section lead: Hands-on tutorial on creating Daksha mock data and detecting GRBs*
- **6th Gravitational Wave Open Data workshop 2023** May 2023
- *Mentor: Offline Study hub at IIT Bombay for 30 students*
- **GROWTH Winter school 2018** Dec 2018
- *Tutor, module testing & organizing the winter school*
- 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

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

Outreach

- **Daksha Socials: Instagram, X (Formerly Twitter), Facebook** 2022-2025
 - *Social Media Lead*
- **Panel Member - Careers in Astrophysics** Sep 2024
 - *Krittika - The Astronomy Club of IIT Bombay*
- **Techfest - Daksha: Indian Eyes on Transient Skies** 2022 - 2024
 - *Booth Coordinator: TechConnect at TechFest IIT Bombay*
- **Techfest - LIGO-India and LIGO GW Detectors** 2017 - 2024
 - *Booth: TechConnect at TechFest IIT Bombay*
- **Technovanza - LIGO-India and GW Detectors** 2023 - 2024
 - *Booth Coordinator: Technovanza at VJTI Mumbai*
- **Invited talk: Astrophysics Adventures - AstroSat, LIGO-India & Beyond** Mar 2024
 - *ZetaGravity's X-Space*
- **Cosmic Exotic Marvels - A journey to the heaviest objects in the universe** Oct 2023
 - *Invited Guest Talk: Pawar International School, Mumbai*
- **Astronomers for Planet Earth International Symposium 2022** Dec 2022
 - *LOC Team Member as a part of A4E*
- **TechFest - Krittika Astrophysics Workshop** Dec 2020
 - *Module and Session lead*
- **Basics of Astronomical Telescopes** Sept 2020
 - *Krittika - Lecture Series on Observational Astronomy*
- **Talk on Basics of Pulsars & their detection in radio data** Oct 2018
 - *Krittika Lecture Series*

Pre-PhD Research and Technical Experience

- **Department of Physics, IIT Bombay** May 2019 - Dec 2019
 - *Project Research Assistant: Mechanical design and testing of Daksha*
- **National Centre for Radio Astrophysics** May 2018 - Oct 2019
 - *Visiting Students Research Program: PuGMark: Blind pulsar searches with uGMRT*
- **Transient visibility from a satellite - A python simulator** July 2017 - April 2018
 - *Advisor: Varun Bhalerao, Physics Department, IIT Bombay*
- **Simulations on Core vs Cusp density problem of Dark Matter** Summers 2017
 - *Advisor: D Narasimha, Department of Astronomy and Astrophysics, TIFR*
- **IIT Bombay Racing (Powertrain Subsystem)** Sept 2016 - April 2017
 - *Junior Design Engineer, Mechanical Department, IIT Bombay*

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

- 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