

# Aditya Vijaykumar

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aditya@utoronto.ca • Website • Canadian Institute for Theoretical Astrophysics (CITA)

RESEARCH INTERESTS    Gravitational Wave Astronomy and Astrophysics, Tests of General Relativity and Cosmology, Scientific Computing

## EMPLOYMENT CITA Postdoctoral Fellow

**Canadian Institute for Theoretical Astrophysics (CITA), Toronto**

*Independent research fellowship*

Sep 2023 - Present

*Member of the LIGO Scientific Collaboration*

## Graduate Student

**International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru**

*Mentored by Prof. Parameswaran Ajith*

Aug 2018 - Aug 2023

*Member of the LIGO Scientific Collaboration and the LIGO-India Scientific Collaboration*

## Fulbright-Nehru Doctoral Research Fellow

**Department of Physics, The University of Chicago**

*Mentored by Prof. Daniel Holz*

Aug 2022 - Mar 2023

## EDUCATION International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru

**Research Scholar and Graduate Student in Physics**

2018 - 2023

## Birla Institute of Technology and Science (BITS), Pilani

**M.Sc. (Hons.) Physics and B.E. (Hons.) Mechanical Engineering**

2013 - 2018

## SEMINARS AND TALKS

- *Probing host environments of gravitational-wave sources* at **Penn State University**, October 2024 (Invited talk)
- *Host galaxies of compact binaries and their impact on dark siren cosmology* at **IUCAA**, August 2024
- *Panelist: Data analysis challenges for next generation detectors* at **PAX Meeting, London**, July 2024 (Invited seminar)
- *Probing host environments of gravitational-wave sources* at **Cardiff University**, July 2024 (Invited seminar)
- *Probing host environments of gravitational-wave sources* at **CIERA, Northwestern University**, June 2024 (Invited seminar)
- *Probing host galaxies of merging compact binaries* at **CASCA Meeting, Toronto**, June 2024 (Contributed talk)
- *Compact binaries in clusters and how to find them* at **Globular Clusters and their Tidal Tails**, May 2024 (Contributed talk)
- *Probing host environments of gravitational-wave sources* at **GRAPPA, University of Amsterdam**, May 2024 (Invited seminar)
- *Probing host environments of gravitational-wave sources* at **Niels Bohr Institute**, April 2024 (Invited seminar)
- *Probing host environments of gravitational-wave sources* at **CITA**, January 2024 (Invited talk)

- *Accelerating binaries and their gravitational-wave signatures* at **TASTY, Department of Astronomy and Astrophysics, University of Toronto**, January 2024 (Invited talk)
- *Accelerating gravitational wave sources* at **Joint CITA-PI Gravitational waves meeting**, October 2023 (Contributed talk)
- *Fast Likelihood Evaluation with Relative Binning* at **IUCAA, Pune**, July 2023 (Invited seminar)
- *Testing General Relativity with Gravitational Waves: Opportunities and Challenges* at **IIT-Gandhinagar**, June 2023 (Invited seminar)
- *Fast Likelihood Evaluation with Relative Binning* at **Seoul National University**, October 2022 (Invited online seminar)
- *Standard Sirens and Large Scale Structure* at **The Quest for Precision Gravitational-wave Cosmology, The University of Chicago**, September 2022 (Invited Talk)
- *Gravitational-wave probes of astrophysics and cosmology: Large Scale Clustering and Lensing* at **IGC, Pennsylvania State University**, August 2022 (Invited Seminar)
- *Constraints on the time variation of the gravitational constant using gravitational-wave observations* at **Second Chennai Symposium on Gravitation and Cosmology**, February 2022 (Invited online Seminar)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **Instituut-Lorentz for Theoretical Physics, Leiden University**, June 2020 (Invited online seminar)
- *Constraints on Black Hole Mimickers using GWTC-1* at **ICTS In-house Symposium**, February 2020 (Contributed Poster)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **ICTS In-house Symposium**, ICTS, Bengaluru, India, February 2020 (Contributed Talk)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **International Conference on Gravitation & Cosmology**, IISER, Mohali, India, December, 2019 (Contributed Talk)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **The Inter-University Centre for Astronomy and Astrophysics (IUCAA)**, Pune, India, September 2019 (Invited Talk)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **Max Planck Institute for Gravitational Physics**, Hannover, Germany, June 2019 (Invited Talk)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **GR22 and Amaldi13**, Valencia, Spain, July 2019 (Contributed Talk)
- *Gravitational Lensing from Orbiting Binary* at the **Paper Presentation competition of APOGEE 2017**, BITS Pilani, India (*Contributed Talk, First runner-up*)

#### TEACHING

- Instructor and organizer, **LIGO-Virgo Collaboration Gravitational-Wave Open Data Workshop #5 and #6** at ICTS.
- Tutor for the **Numerical Relativity** graduate course, ICTS, Jan-April 2022.
- Co-organizer and tutor, **ICTS Workshop on Parameter Estimation with bilby**, ICTS, Bengaluru, India, August 2020 (Online)
- Tutor, **Light and Beyond—Summer Course for Undergraduate Students** by Prof. Rajaram Nityananda, June 2020 (Online)
- Tutor, **LIGO-Virgo Collaboration Gravitational-Wave Open Data Workshop #3**, May 2020 (Online)
- Tutor for the following mini-courses, **ICTS Summer Schools on Gravitational Wave Astronomy**, ICTS, Bengaluru, India:

1. *Compact binary evolution, rates and population modelling*, June 2022.
2. *Astrophysical Stochastic GW Foreground*, July 2021.
3. *Numerical Hydrodynamics*, May 2020.
4. *Advanced General Relativity*, July 2019.

OTHER CONFERENCES AND MEETINGS	<ul style="list-style-type: none"> <li>• Participant, <b>Gravitational waves: A new ear on the chemistry of galaxies</b>, Lorentz Center, Leiden, Netherlands. April 2024.</li> <li>• Semester Participant, <b>Advances in Computational Relativity</b>, ICERM, Brown University, USA. September 2020 - December 2020 (Online)</li> <li>• Participant, <b>Discussion Meeting - Astrophysics of Supermassive Black Holes</b>, ICTS, Bengaluru, India, December 2019</li> <li>• Participant, <b>Discussion Meeting - Future of Gravitational Wave Astronomy</b>, ICTS, Bengaluru, India, August 2019</li> <li>• Participant, <b>ICTS Summer School on Gravitational Wave Astronomy</b>, ICTS, Bengaluru, India, July 2017, July 2018, July 2019, May 2020, July 2021, May 2022.</li> </ul>
MENTORSHIP	<ul style="list-style-type: none"> <li>• Ben Stadel (University of Alberta) May 2024 - <i>Present</i></li> <li>• Kaustubh Gupta (IISER, Pune) May 2022 - May 2023</li> <li>• Adhrit Ravichandran (IIT Roorkee → UMass Dartmouth) Sep 2021 - Aug 2022</li> <li>• Kruthi Krishna (IISc → Radboud University) Sep 2020 - Aug 2021</li> <li>• Harsh Narola (IISER, Tirupati → Utrecht University) Sep 2020 - Aug 2021</li> </ul>
OUTREACH	<ul style="list-style-type: none"> <li>• Co-PI of the <i>IndiaBioscience Outreach Grant</i> to communicate science using stage theatre.</li> <li>• Panelist at the <i>Bengaluru: The Astronomy City</i>, a Q&amp;A event organized for <b>National Science Day</b>, February 2022.</li> <li>• Moderated a discussion with Prof. Smitha Vishveshwara on her collaborative science theatre project <i>Quantum Voyages</i> as a part of <b>Cosmic Zoom Online Exhibition</b>, April 2021</li> <li>• Articles on the <b>ICTS blog</b>: <ol style="list-style-type: none"> <li>1. <b>A Conversation with ICTS Scientists Studying the Indian Monsoon</b>, November 2019</li> <li>2. <b>Summer School on Gravitational Wave Astronomy</b>, November 2019</li> </ol> </li> <li>• Talk titled <i>The Whats, Whys and Hows of Gravitational-wave Astronomy</i>, <b>BMS College of Engineering, Bengaluru</b>, November 2019</li> <li>• Talk titled <i>Gravitational Waves - A New Tool for Cosmology!</i> at <b>Vigyan Samagam</b>, Visvesvaraya Industrial and Technological Museum, Bengaluru, India, August 2019</li> </ul>
TECHNICAL SKILLS	<b>Programming Languages</b> - Python, C, C++, Shell Script <b>Softwares</b> - MATLAB, Mathematica <b>Tools/Frameworks</b> - L <sup>A</sup> T <sub>E</sub> X, Git

SCORES AND  
AWARDS

- [Fulbright-Nehru Doctoral Research Fellowship](#) 2023 (Host Institution: The University of Chicago)
- ICTS Graduate Fellowship 2018-2023
- Secured all-India rank 21 in the [Joint Entrance Screening Test \(JEST\)](#), 2018 for admission into Physics PhD programmes in India
- Awarded the [ICTS S.N. Bhatt Memorial Excellence Fellowship](#), 2018
- Scored 960/990 on the [Subject GRE in Physics](#), October 2017
- Selected for the [Summer Research Fellowship](#) of the Indian Academy of Sciences in 2016
- Receptient of the [INSPIRE-DST Scholarship for Higher Education](#) for the period 2013 to 2018

REFERENCES

Prof. Parameswaran Ajith  
International Centre for Theoretical Sciences  
(ICTS-TIFR),  
Shivakote, Hesaraghatta-Hobli,  
Bengaluru, 560089, India.  
[ajith@icts.res.in](mailto:ajith@icts.res.in)

Prof. Daniel E. Holz  
The University of Chicago,  
Michelson Center for Physics,  
Chicago, IL 60637, USA.  
[holz@uchicago.edu](mailto:holz@uchicago.edu)

Prof. Maya Fishbach  
Canadian Institute for Theoretical Astro-  
physics,  
60 St George St,  
Toronto, ON M5S 3H8, Canada.  
[fishbach@cita.utoronto.ca](mailto:fishbach@cita.utoronto.ca)

Prof. Shasvath J. Kapadia  
Inter-University Centre for Astronomy and  
Astrophysics,  
Post Bag 4, Ganeshkhind,  
Pune, 411007, India  
[shasvath.kapadia@iucaa.in](mailto:shasvath.kapadia@iucaa.in)