

# Aditya Vijaykumar

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 **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.

#### MENTORSHIP

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|---|---------------------------|
| • Kaustubh Gupta (IISER, Pune)                        | May 2022 - <i>Present</i> |
| • Adhrit Ravichandran (IIT Roorkee → UMass Dartmouth) | Sep 2021 - Aug 2022       |
| • Kruthi Krishna (IISc → Radboud University)          | Sep 2020 - Aug 2021       |
| • Harsh Narola (IISER, Tirupati → Utrecht University) | Sep 2020 - Aug 2021       |

OTHER CONFERENCES AND MEETINGS	<ul style="list-style-type: none"> <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>
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	<ul style="list-style-type: none"> <li>• <b>Fulbright-Nehru Doctoral Research Fellowship</b> 2023 (Host Institution: The University of Chicago)</li> <li>• <b>ICTS Graduate Fellowship</b> 2018-2023</li> <li>• Secured all-India rank 21 in the <b>Joint Entrance Screening Test (JEST)</b>, 2018 for admission into Physics PhD programmes in India</li> <li>• Awarded the <b>ICTS S.N. Bhatt Memorial Excellence Fellowship</b>, 2018</li> <li>• Scored 960/990 on the <b>Subject GRE in Physics</b>, October 2017</li> <li>• Selected for the <b>Summer Research Fellowship</b> of the Indian Academy of Sciences in 2016</li> <li>• Recipient of the <b>INSPIRE-DST Scholarship for Higher Education</b> for the period 2013 to 2018</li> </ul>

## REFERENCES

Prof. Parameswaran Ajith  
International Centre for Theoretical Sciences  
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