

Aditya Vijaykumar

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RESEARCH INTERESTS	Gravitational Wave Astronomy and Astrophysics, Tests of General Relativity and Cosmology, Scientific Computing
EDUCATION	International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru Research Scholar and Graduate Student in Physics 2018 - Present Birla Institute of Technology and Science (BITS), Pilani M.Sc. (Hons.) Physics and B.E. (Hons.) Mechanical Engineering 2013 - 2018
EMPLOYMENT	Graduate Student International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru Mentored by <i>Prof. Parameswaran Ajith</i> Aug 2018 - Present Member of the <i>LIGO Scientific Collaboration</i> and the <i>LIGO-India Scientific Collaboration</i> Summer Research Intern International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru Mentored by <i>Prof. Parameswaran Ajith</i> May 2018 - July 2018 Topic - <i>Cosmological Large-scale Structure probes using gravitational-wave observations</i> Visiting Student (Masters Thesis) Centre for High Energy Physics (CHEP), Indian Institute of Science (IISc), Bengaluru, India Mentored by <i>Prof. Chethan Krishnan</i> July 2017 - April 2018 Topic - <i>Complexity in context of Locality, Entanglement and Quantum Gravity</i> Summer Research Intern The Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India Mentored by <i>Prof. Raghunathan Srianand</i> May 2016 - July 2016 Topic - <i>Analysis of Quasar Absorption Lines from SDSS Photometric Data</i> Summer Research Intern The National Centre for Radio Astrophysics (NCRA-TIFR), Pune, India Mentored by <i>Prof. Yashwant Gupta</i> May 2015 - July 2015 Topic - <i>Testing the fast transient detection pipeline of the GMRT</i>
TEACHING	<ul style="list-style-type: none">• Participant and Tutor for the <i>Astrophysical Stochastic GW Foreground</i> mini-course, ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, July 2021 (Online)• 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)• Participant and Tutor for the <i>Numerical Hydrodynamics</i> mini-course, ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, May-June 2020 (Online)• Participant and Tutor for the <i>Advanced General Relativity</i> mini-course, ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, July 2019
MENTORSHIP	<ul style="list-style-type: none">• Kruthi Krishna (IISc → Radboud University) Sep 2020 - Present• Harsh Narola (IISER, Tirupati → Utrecht University) Sep 2020 - Present

7. Sumit Kumar, **Aditya Vijaykumar**, Alexander H. Nitz
Detecting Baryon Acoustic Oscillations with third generation gravitational wave observatories,
Submitted to *The Astrophysical Journal*, [arXiv:2110.06152](#).
6. Saleem et al. (including **Aditya Vijaykumar**)
The Science Case for LIGO-India
Submitted to *Classical and Quantum Gravity*, [arXiv:2105.01716](#).
5. Abbott et al. (LIGO Scientific and Virgo Collaborations, including **Aditya Vijaykumar**)
Tests of General Relativity with Binary Black Holes from the second LIGO-Virgo Gravitational-Wave Transient Catalog.
Phys. Rev. D **103** (2021) 12, 122002, [arXiv:2010.14529](#).
4. Abbott et al. (LIGO Scientific and Virgo Collaborations, including **Aditya Vijaykumar**)
GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run.
Phys. Rev. X **11** (2021) 021053, [arXiv:2010.14527](#).
3. **Aditya Vijaykumar**, M. V. S. Saketh, Sumit Kumar, Parameswaran Ajith, Tirthankar Roy Choudhury
Probing the large scale structure using gravitational wave observations of binary black holes,
Submitted to *Physical Review Letters*, [arXiv:2005.01111](#).
In press: [Astrobites](#).
2. **Aditya Vijaykumar**, Shasvath J. Kapadia, Parameswaran Ajith
Constraints on the time variation of the gravitational constant using gravitational wave observations of binary neutron stars,
Phys. Rev. Lett. **126**, 141104 (2021), [arXiv:2003.12832](#).
In press: [phys.org](#).
1. P. Virtanen et al. (including **Aditya Vijaykumar** as *SciPy 1.0 Contributor*)
SciPy 1.0—Fundamental Algorithms for Scientific Computing in Python,
Nat Methods **17**, 261–272 (2020), [arXiv:1907.10121](#).

SEMINARS AND TALKS

- *Probing Large Scale Structure using Binary Black Hole Observations* at **Instituut-Lorentz for Theoretical Physics, Leiden University**, Leiden, Netherlands, June 2020 (Online Invited Seminar)
- *Constraints on Black Hole Mimickers using GWTC-1* at **ICTS In-house Symposium**, ICTS, Bengaluru, India, 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)

OTHER CONFERENCES AND MEETINGS	<ul style="list-style-type: none"> • Semester Participant, Advances in Computational Relativity, ICERM, Brown University, USA. September 2020 - December 2020 (Online) • Participant, Discussion Meeting - Astrophysics of Supermassive Black Holes, ICTS, Bengaluru, India, December 2019 • Participant, Discussion Meeting - Future of Gravitational Wave Astronomy, ICTS, Bengaluru, India, August 2019 • Participant, ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, July 2018 • Participant, ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, July 2017
OUTREACH	<ul style="list-style-type: none"> • Moderated a discussion with Prof. Smitha Vishveshwara on her collaborative science theatre project <i>Quantum Voyages</i> as a part of Cosmic Zoom Online Exhibition, April 2021 • Articles on the ICTS blog: <ol style="list-style-type: none"> 1. A Conversation with ICTS Scientists Studying the Indian Monsoon, November 2019 2. Summer School on Gravitational Wave Astronomy, November 2019 • Talk titled <i>The Whats, Whys and Hows of Gravitational-wave Astronomy</i>, BMS College of Engineering, Bengaluru, November 2019 • Talk titled <i>Gravitational Waves - A New Tool for Cosmology!</i> at Vigyan Samagam, Visvesvaraya Industrial and Technological Museum, Bengaluru, India, August 2019
TECHNICAL SKILLS	<p>Programming Languages - Python, C, C++, Shell Script</p> <p>Softwares - MATLAB, Mathematica</p> <p>Tools/Frameworks - L^AT_EX, Git</p>
SCORES AND AWARDS	<ul style="list-style-type: none"> • 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 • Recipient of the INSPIRE-DST Scholarship for Higher Education for the period 2013 to 2018
REFERENCES	<ul style="list-style-type: none"> • Prof. Parameswaran Ajith, ICTS – ajith@icts.res.in • Dr. Shasvath Kapadia, ICTS – shasvath.kapadia@icts.res.in • Dr. Sumit Kumar, AEI Hannover – sumit.kumar@aei.mpg.de • Prof. Bala Iyer, ICTS – bala.iyer@icts.res.in