Aditya Vijaykumar

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Reserach 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 Prof. Parameswaran Ajith Aug 2018 - *Present*
Member of the LIGO Scientific Collaboration and the LIGO-India Scientific Collaboration

Summer Research Intern
International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru
Mentored by Prof. Parameswaran Ajith May 2018 - July 2018
Topic - Cosmological Large-scale Structure probes using gravitational-wave observations

Visiting Student (Masters Thesis)
Centre for High Energy Physics (CHEP), Indian Institute of Science (IISc), Bengaluru, India
Mentored by Prof. Chethan Krishnan July 2017 - April 2018
Topic - Complexity in context of Locality, Entanglement and Quantum Gravity

Summer Research Intern
The Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India
Mentored by Prof. Raghunathan Srianand May 2016 - July 2016
Topic - Analysis of Quasar Absorption Lines from SDSS Photometric Data

Summer Research Intern
The National Centre for Radio Astrophysics (NCRA-TIFR), Pune, India
Mentored by Prof. Yashwant Gupta May 2015 - July 2015
Topic - Testing the fast transient detection pipeline of the GMRT

Papers

6. Saleem et al. (including **Aditya Vijaykumar**)
   The Science Case for LIGO-India
   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.
   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.
   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 Invited Talks

- *Probing Large Scale Structure using Binary Black Hole Observations* at ***Instituut-Lorentz* for Theoretical Physics, Leiden University**, Leiden, Netherlands, June 2020 (Online)
- *Probing Large Scale Structure using Binary Black Hole Observations* at **The Inter-University Centre for Astronomy and Astrophysics (IUCAA)**, Pune, India, September 2019
- *Probing Large Scale Structure using Binary Black Hole Observations* at **Max Planck Institute for Gravitational Physics**, Hannover, Germany, June 2019

Conferences, and other Meetings

- Semester Participant, **Advances in Computational Relativity**, ICERM, Brown University, USA. September 2020 - December 2020 (Online)
- Poster titled *Constraints on Black Hole Mimickers using GWTC-1* at **ICTS In-house Symposium**, ICTS, Bengaluru, India, February 2020
- Talk titled *Probing Large Scale Structure using Binary Black Hole Observations* at **ICTS In-house Symposium**, ICTS, Bengaluru, India, February 2020
- Participant, **Discussion Meeting - Astrophysics of Supermassive Black Holes**, ICTS, Bengaluru, India, December 2019
- Talk titled *Probing Large Scale Structure using Binary Black Hole Observations* at **International Conference on Gravitation & Cosmology**, IISER, Mohali, India, December, 2019
- Participant, **Discussion Meeting - Future of Gravitational Wave Astronomy**, ICTS, Bengaluru, India, August 2019
- Talk titled *Probing Large Scale Structure using Binary Black Hole Observations* at **GR22 and Amaldi13**, Valencia, Spain, July 2019
- Talk titled *Gravitational Lensing from Orbiting Binary* at the **Paper Presentation competition of APOGEE 2017**, BITS Pilani, India (*First runner-up*)

Schools and Tutoring

- Co-organizer and tutor, **ICTS Workshop on Parameter Estimation with bilby**, ICTS, Bengaluru, India, August 2020 (Online)
- Tutor, **LIGO-Virgo Collaboration Gravitational-Wave Open Data Workshop #3**, May 2020 (Online)
- Participant and Tutor for the *Numerical Hydrodynamics* mini-course, **ICTS Summer School on Gravitational Wave Astronomy**, ICTS, Bengaluru, India, May-June 2020 (Online)
- Participant and Tutor for the *Advanced General Relativity* mini-course, **ICTS Summer School on Gravitational Wave Astronomy**, ICTS, Bengaluru, India, July 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 Talks

- *The Whats, Whys and Hows of Gravitational-wave Astronomy*, **BMS College of Engineering, Bengaluru**, November 2019
- *Gravitational Waves - A New Tool for Cosmology!* at **Vigyan Samagam**, Visvesvaraya Industrial and Technological Museum, Bengaluru, India, August 2019

Technical Skills

Programming Languages - Python, C, C++, Shell Script
Softwares - MATLAB, Mathematica
Tools/Frameworks - LaTeX, Git

Scores and Awards

- Scored 960/990 on the Subject GRE in Physics, October 2017
- 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
- Selected for the Summer Research Fellowship of the Indian Academy of Sciences in 2016
- Recepient of the INSPIRE-DST Scholarship for Higher Education for the period 2013 to 2018

References

- 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