

Aditya Vijaykumar

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EDUCATION	International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru Graduate Student in Physics	2018 - <i>Present</i>
	Birla Institute of Technology and Science (BITS), Pilani M.Sc. (Hons.) Physics and B.E. (Hons.) Mechanical Engineering	2013 - 2018
	High School - St. Vincent's High School, Pune (Maharashtra HSC) - 94.27%	2011 - 2013
	Secondary School - Rosary High School, Pune (Maharashtra SSC) - 93.27%	1999 - 2011
RESEARCH EXPERIENCE	Project Student International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru, India <i>Mentored by Prof. P. Ajith and Dr. Sumit Kumar</i> Cosmology using Binary Black Hole Mergers - We attempt to understand how the distribution of binary black hole mergers in future detections can be used to constrain cosmology using correlation functions and the power spectrum of these mergers. Visiting Student (Masters Thesis) Centre for High Energy Physics (CHEP), Indian Institute of Science (IISc), Bengaluru, India <i>Mentored by Prof. Chethan Krishnan</i> Complexity in context of Locality, Entanglement and Quantum Gravity - We aim to extract lessons for quantum gravity by studying the interplay of entanglement and locality in a few physical systems. We reviewed the various conjectures on complexity and related concepts, and attempted calculating complexity for different field theories. Summer Research Intern The Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India <i>Mentored by Prof. Raghunathan Srianand</i> Analysis of Quasar Absorption Lines from SDSS Photometric Data - Using photometric data of quasars with absorbers in their line of sight taken from the Sloan Digital Sky Survey (SDSS), we used some image processing techniques such as stacking to establish a correspondence between the results already obtained from the spectral data also taken from SDSS. We used some statistical methods to establish this result. Summer Research Intern The National Centre for Radio Astrophysics (NCRA-TIFR), Pune, India <i>Mentored by Prof. Yashwant Gupta</i> Testing and Debugging the Transient Detection Pipeline of GMRT - Squashed crucial bugs and tested the transient pipeline using test data from known and reliable transient sources such as pulsars. Also reviewed key concepts of radio astronomy and pulsar astrophysics in the process.	January 2018 - Present July 2017 - April 2018 May 2016 - July 2016
SELECTED PROJECTS	Gauge Theory in Particle Physics <i>Mentored by Prof. Biswanath Layek, BITS Pilani</i> A brief introduction to gauge theory and its applications in particle physics. We started off by studying gauges, their properties, and usage, and went on to apply these concepts to electromagnetism, QED, QCD and some other cases. Entanglement Production in Coupled Chaotic Systems <i>Mentored by Prof. J N Bandyopadhyay and Prof. Tapomoy G Sarkar, BITS Pilani</i> A computational study of chaotic properties of a coupled chaotic system. We considered a coupled top, and using some approximation methods to the Hamiltonian, found the chaotic properties within some parameter ranges. A statistical analysis of the properties followed, with results. Black Holes <i>Mentored by Prof. Tapomoy G Sarkar, BITS Pilani</i> An in-depth study on black holes and their various aspects. Starting with a review of black holes with	Aug 2016 - Dec 2016 Aug 2016 - June 2017 Jan 2017 - June 2017

different metrics, we also conducted a brief review of naked singularities and paths to quantum gravity. We also revised a fair bit of general relativity in the process.

RELEVANT COURSES	Classical Mechanics, Electromagnetic Theory, Quantum Mechanics, Mathematical Methods in Physics, Statistical Mechanics, Computational Physics, Particle Physics, General Theory of Relativity and Cosmology (did not credit), Quantum Field Theory (did not credit), Introductory Astronomy and Astrophysics
CONFERENCES, SCHOOLS AND TALKS	<ul style="list-style-type: none">• ICTS Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, India, July 2017• Presented a paper titled <i>Gravitational Lensing from Orbiting Binary</i> at APOGEE 2017, BITS Pilani• IISc Journal Club talk titled <i>Teleportation Through the Wormhole</i>, based on arXiv:1707.04354
TECHNICAL SKILLS	Programming Languages - Python, C, C++, Shell Script Softwares - MATLAB, Maple Tools/Frameworks - \LaTeX , Git
SCORES AND AWARDS	<ul style="list-style-type: none">• 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• Receptient of the INSPIRE-DST Scholarship for Higher Education for the period 2013 to 2018