Curriculum Vitae

Name	Archisman Ghosh
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Position	**Delta Institute of Theoretical Physics Postdoctoral Scientist**
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ORCiD	0000-0003-0423-3533
Birth	1983 March 05 (Calcutta, India).
Citizenship	Indian.

Education

- Ph.D. (2012 August), Department of Physics and Astronomy, University of Kentucky, Lexington, KY, USA.
  Dissertation title: *"Time dependent systems and chaos in string theory"*.
  Supervisor: **Prof. Sumit R. Das.**
- M.Sc. (Integrated) in Physics (2006 May), Indian Institute of Technology (IIT) Kanpur, India.

Current Research Interests

Gravitational-wave physics and astronomy:

- **Multimessenger** astronomy
- **Cosmology** using gravitational-wave observations
- **Strong field gravity** and nature of compact objects
- Data analysis and parameter estimation of compact binary coalescences

Academic Memberships and Institutional Responsibilities

2017 November – *present*	**Co-chair, Cosmology** working group of Compact Binary Coalescences data analysis group, LIGO-Virgo Collaboration.
2016 September – *present*	Member, **Virgo Collaboration**.
2018 April – *present*	Member, **Einstein Telescope Consortium**.
2018 March – *present*	Member and contributor, **"Gravity Data" Group** of the COST (European Cooperation in Science and Technology) action network "Gravitational waves, black holes, and fundamental physics".
2018 February – 2019 March	Data analysis liaison for **Exotic Objects and Phenomena** subgroup of Extreme Gravity, GWIC-3G (Gravitational Wave International Committee – Third Generation Ground-based Detectors) Science Case Team.
2018 January – *present*	Member and contributor, **GWIC-3G** Science Case Team.
2014 May – *present*	Active contributor in **Parameter Estimation** and **Testing General Relativity** working groups of Compact Binary Coalescences data analysis group, LIGO-Virgo Collaboration.
2014 May – 2016 August	Member, **LIGO Scientific Collaboration**.
2014 April – *present*	Member, Indian Initiative in Gravitational-Wave Observations (IndIGO).

Previous Academic Positions

2016 September – 2019 August	**Postdoctoral Scientist**, Nikhef, Amsterdam, The Netherlands.
2015 September – 2016 August	**Max Planck Prize Postdoctoral Fellow**, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research (ICTS-TIFR), Bangalore, India.
2013 September – 2015 August	**Airbus** (formerly EADS) **Prize Postdoctoral Fellow**, ICTS-TIFR, Bangalore, India.
2012 August – 2013 August	**Postdoctoral Visiting Fellow**, ICTS-TIFR, Bangalore, India.

Awards and Fellowships

- Gruber Cosmology Prize 2016 *(awarded jointly to the LIGO-Virgo Collaboration).*
- Special Breakthrough Prize in Fundamental Physics 2016 *(awarded jointly to the LIGO-Virgo Collaboration).*
- Max Planck Prize Postdoctoral Fellowship, ICTS-TIFR (2015 September – 2016 August).
- Airbus (formerly EADS) Prize Postdoctoral Fellowship, ICTS-TIFR (2013 September – 2015 August).
- Dissertation Year Fellowship, University of Kentucky (2011 – 2012).
- Presidential Fellowship, University of Kentucky (2009 – 2010).
- Max Steckler Fellowship, University of Kentucky (2006, 2007).
- Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship awarded by Department of Science and Technology, Government of India (2001 – 2006).
- Undergraduate Associateship at Saha Institute of Nuclear Physics, Kolkata, India (2002 – 2004).
- Institute Award for Academic Excellence, IIT Kanpur (2001 – 2002).
- National Talent Search (NTS) Scholarship awarded by National Council of Educational Research and Training, India (1999 – 2001).

Student Mentoring and Supervision

Ka Wa Tsang (2016 – *present*)	Partial supervision of PhD thesis: *"Probing the physics of black holes and neutron stars with gravitational waves".*
Abhirup Ghosh (2014 – 2016)	Partial supervision of PhD thesis: *"Testing general relativity using observations of gravitational waves from the inspiral, merger and ringdown of binary black holes".*
Ankan Sur (2017 – 2018)	Masters thesis: *"Clibming the cosmos without ladders: Systematic effects in estimation of cosmological parameters using gravitational-wave observations of compact binaries and their cross-correlation with a galaxy catalogue".*
Michiel Rollier (2017 – 2018)	Masters thesis: *"Finding Echoes: The characterisation of gravitational-wave echoes and the investigation of a morphology-independent data analysis method for detecting them".*
Aravind Ravi (2015 – 2016)	Masters project: *"Importance of geographical location on the prospects of electromagnetic follow-up of early gravitational-wave detections".*
Siddharth Mohite (2014 – 2015)	Masters thesis: *"Parameter estimation of compact binary coalescences".*
Rachael Huxford (2017 Summer)	Bachelors project: *"Induced bias in recovery of spinning neutron star binaries with non-spinning waveforms".*
Other undergraduate summer students:	Jinali Haria (2016 Summer), Nishad Bapatdhar (2015 Summer), Sudarshan Ghonge (2014 Summer), Jyotisman Sahoo, Harish Srinivas, Yadukrishnan (2013 Summer).

Recent Research Highlights

I am a leading member of the Virgo Collaboration, which together with the LIGO Scientific Collaboration jointly analyses all LIGO-Virgo data. I have been a part of the discovery of gravitational waves from the merger of a binary of black holes, and the subsequent detections of gravitational-wave sources by the LIGO-Virgo.

- **Lead developer of the inspiral-merger-ringdown consistency test**, one of the first tests of general relativity performed in its highly dynamical and extremely strong field regime.
- Developed methods that can probe into the nature of compact objects detected in gravitational-wave observations, distinguishing black holes from exotic objects mimicking them; these can potentially show some of the first signatures of new or unknown physics.
- Worked in collaboration of astronomers in developing electromagnetic follow-up strategies of gravitational-wave candidate events.
- **Delivered the first "standard-siren" measurement of the Hubble constant**, a crucial parameter in cosmology governing the rate of expansion of the universe, from gravitational waves from a binary neutron star merger and its associated electromagnetic counterpart.
- **Initiated the formation of and currently leading (as a co-chair) the cosmology working group of the LIGO-Virgo Collaboration**; currently coordinating the development of the infrastructure for gravitational-wave cosmology for the years to come.

LIGO-Virgo Collaboration Activities

- As a member of the paper writing team, delivered *"A gravitational-wave standard siren measurement of the Hubble constant"* Nature **551**, no. 7678, 85 (2017).
- Served as a liaison of Testing General Relativity group for GW170104 and GW170608 paper writing teams.

Organizational Activities

- "Probing Strong-Field Gravity in the Advanced GW Detector Era" as a part of Corfu Summer Institute, Corfu, Greece (2017 September 18–23); co-organizer.
- "ICTS Summer School on Gravitational-Wave Astronomy" (2016 July 25 – August 05); co-organizer and tutor.
- "Gravitational-Wave Boot Camp for IndIGO members", at ICTS Bangalore, India (2016 July 23–24); co-organizer.
- "ICTS Summer School on Gravitational-Wave Astronomy" (2015 June 29 – July 10); co-organizer and tutor.
- "Gravitational-Wave Boot Camp for IndIGO members", at IUCAA Pune, India (2015 April 29 – May 01); co-organizer.
- "Astronomical Society of India (ASI) Satellite Workshop on Gravitational Wave Data Analysis" Hands-on Session, IISER Mohali, India (2014 March 19); co-organizer.
- "ICTS program on Numerical Relativity" (2013 June 10 – July 05); co-organizer.
- "ICTS Planck Day (2013 April 16)" – A discussion meeting on the results of Planck 2013; co-organizer.

Academic Peer-Review for Journals

- **Physical Review Letters / Physical Review D** (APS) [Impact factors: 8.839 / 4.506].
- **The Astrophysical Journal Letters** (IOP Science) [Impact factor: 6.634].
- **Physics of the Dark Universe** (Elsevier) [Impact factor: 6.509].
- **Monthly Notices of the Royal Astronomical Society** (MNRAS) [Impact factor:4.961].
- **General Relativity and Gravitation** (Springer) [Impact factor: 1.721].

Teaching

Course title	**Duration**	**Institution / Event**
Gravitational Wave Cosmology	3 lectures	Cosmology – The Next Decade School @ ICTS Bangalore
Gravitational Wave Data Analysis	1 lecture	University College Utrecht
General Relativity (reading course)	2 months	ICTS Bangalore
Numerical Statistics, Hypothesis Testing and Bayesian Inference	2×2 months	ICTS Bangalore
Gravitational Wave Data Analysis	Full day	Astronomical Society of India Satellite Workshop
Physics & Astronomy for Elementary & Middle School Teachers (hands-on laboratory course)	2×4 months	University of Kentucky
Condensed Matter Theory (grader)	4 months	University of Kentucky
Stars, Galaxies And The Universe (teaching assistant)	2×4 months	University of Kentucky
The Solar System (teaching assistant)	2×4 months	University of Kentucky
General College Physics II: Electricity, Magnetism & Optics (teaching assistant)	2×4 months	University of Kentucky

Outreach

- "Beginning of a new era of astronomy" – outreach event for "Climber Astronomy Track" for engineering undergraduate astronomy enthusiasts, Bangalore (2016 June 30).
- Public engagement for years as Graduate Assistant at the MacAdam Student Observatory, University of Kentucky (2007 – 2008).