

# Rana X Adhikari

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Google Scholar: <https://scholar.google.com/citations?user=5wGd4NsAAAAJ>

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## EDUCATION

1998      B.S. Physics, University of Florida  
2004      Ph.D. Physics, MIT

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## APPOINTMENTS

2004      Postdoctoral Scholar, Caltech  
2006      Assistant Professor of Physics, Caltech  
2012      Professor of Physics, Caltech (tenured)  
2012–      Adjunct Faculty, ICTS-TIFR, Bengaluru

Member of IQIM and QSE at Caltech. Research: precision measurement, gravitational-wave detection, quantum measurement, detector design.

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## HONORS AND AWARDS

2005      Inaugural LIGO Thesis Prize  
2009      Caltech Graduate Student Mentoring Award  
2016      Special Breakthrough Prize in Fundamental Physics (shared, LIGO team)  
2018      Fellow, American Physical Society  
2019      New Horizons in Physics Prize

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## PUBLICATIONS

### *Selected papers*

1. Shruti Maliakal, Zachary Mann, Christopher Wipf, **Rana X Adhikari**, Su Direkci, and Yanbei Chen, "Optimized Quantum States for Sensing in the Presence of Loss and Phase Noise," arXiv:2606.19649 (2026). <https://arxiv.org/abs/2606.19649>
2. Jonathan Klimesch *et al.*, "Designing physics experiments with artificial intelligence," *Nature* **657**, 47–58 (2026). <https://doi.org/10.1038/s41586-026-10898-6>
3. Carlos Ruiz-Gonzalez, Sören Arlt, Sebastian Lehner, Arturs Berzins, Yehonathan Drori, **Rana X Adhikari**, Johannes Brandstetter, and Mario Krenn, "Neural surrogates for designing gravitational wave detectors," *Machine Learning: Science and Technology* **7**, 055010 (2026). <https://doi.org/10.1088/2632-2153/ae9de9>
4. Jonas Buchli *et al.*, "Improving cosmological reach of a gravitational wave observatory using Deep Loop Shaping," *Science* **389**, 1012–1015 (2025). <https://doi.org/10.1126/science.adw1291>
5. Mario Krenn, Yehonathan Drori, and **Rana X Adhikari**, "Digital Discovery of Interferometric Gravitational Wave Detectors," *Physical Review X* **15**, 021012 (2025). <https://doi.org/10.1103/physrevx.15.021012>
6. M. Saleem *et al.*, "The science case for LIGO-India," *Classical and Quantum Gravity* **39**, 025004 (2022). <https://doi.org/10.1088/1361-6382/ac3b99>

7. Haixing Miao, **Rana X Adhikari**, Yiqiu Ma, Belinda Pang, and Yanbei Chen, “Towards the Fundamental Quantum Limit of Linear Measurements of Classical Signals,” *Physical Review Letters* **119**, 050801 (2017). <https://doi.org/10.1103/physrevlett.119.050801>
8. **Rana X Adhikari**, “Gravitational radiation detection with laser interferometry,” *Reviews of Modern Physics* **86**, 121–151 (2014). <https://doi.org/10.1103/revmodphys.86.121>

*Selected LIGO Scientific Collaboration papers*

1. B. P. Abbott *et al.*, “Observation of Gravitational Waves from a Binary Black Hole Merger,” *Physical Review Letters* **116**, 061102 (2016). <https://doi.org/10.1103/physrevlett.116.061102>
2. B. P. Abbott *et al.*, “GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral,” *Physical Review Letters* **119**, 161101 (2017). <https://doi.org/10.1103/physrevlett.119.161101>
3. B. P. Abbott *et al.*, “Multi-messenger Observations of a Binary Neutron Star Merger,” *The Astrophysical Journal Letters* **848**, L12 (2017). <https://doi.org/10.3847/2041-8213/aa91c9>
4. J. Aasi *et al.*, “Advanced LIGO,” *Classical and Quantum Gravity* **32**, 074001 (2015). <https://doi.org/10.1088/0264-9381/32/7/074001>
5. B. P. Abbott *et al.*, “Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A,” *The Astrophysical Journal Letters* **848**, L13 (2017). <https://doi.org/10.3847/2041-8213/aa920c>
6. B. P. Abbott *et al.*, “GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs,” *Physical Review X* **9**, 031040 (2019). <https://doi.org/10.1103/physrevx.9.031040>
7. B. P. Abbott *et al.*, “GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence,” *Physical Review Letters* **116**, 241103 (2016). <https://doi.org/10.1103/physrevlett.116.241103>
8. B. P. Abbott *et al.*, “GW170817: Measurements of Neutron Star Radii and Equation of State,” *Physical Review Letters* **121**, 161101 (2018). <https://doi.org/10.1103/physrevlett.121.161101>
9. B. P. Abbott *et al.*, “GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2,” *Physical Review Letters* **118**, 221101 (2017). <https://doi.org/10.1103/physrevlett.118.221101>
10. R. Abbott *et al.*, “GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo during the First Half of the Third Observing Run,” *Physical Review X* **11**, 021053 (2021). <https://doi.org/10.1103/physrevx.11.021053>

The full list of publications is on Google Scholar:

<https://scholar.google.com/citations?user=5wGd4NsAAAAJ>