Steven Reyes

Personal details

Citizenship	United States of America
Birth	May 4, 1992
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Education

Syracuse University **2014-Present**
Doctor of Philosophy in Physics
Advisor: Dr. Duncan Brown.
Expected Graduation date: 2019

University of Chicago **2010-2014**
Bachelor of Arts in Physics with Astrophysics specialization

Employment

Graduate Student Research Assistant **2015-Present**
Syracuse University, Advisor: Dr. Duncan Brown

CARMA data analyst **2012-2013**
University of Chicago, Advisor: Dr. John Carlstrom

Honors and Awards

Gruber Cosmology Prize **2016**
The Gruber Foundation
Shared with the LSC
Breakthrough Prize in Fundamental Physics **2016**

Shared with the LSC
STEM Fellowship **2014, 2016**
Syracuse University

Odyssey Scholarship **2010-2014**
University of Chicago

Chicago Public School (CPS) Scholarship **2010-2014**
University of Chicago

Publications in which Steven Reyes made a significant contribution

Nitz, Alexander H and Capano, Collin and Nielsen, Alex B. and Reyes, Steven and White, Rebecca and Brown, Duncan A. and Krishnan, Badri. "1-OGC: The first open gravitational-wave catalog of binary mergers from analysis of public Advanced LIGO data". In: (2018). arXiv:1811.01921 [gr-qc]

Steven Reyes and Duncan A. Brown. "Constraints on non-linear tides due to *p-g* mode coupling from the neutron-star merger GW170817". In: (2018). arXiv: 1808.07013 [astro-ph.HE]

Nitz, Alexander H. and Dal Canton, Tito and Davis, Derek and Reyes, Steven "Rapid detection of gravitational waves from compact binary mergers with PyCBC Live". In: *Phys. Rev.* D98.2 (2018), p. 024050. DOI: 10.1103/PhysRevD.98.024050. arXiv: 1805.11174 [gr-c]

Benjamin P. Abbott et al. "Upper Limits on the Rates of Binary Neutron Star and Neutron Star–black Hole Mergers From Advanced Ligo's First Observing run". In: *Astrophys. J.* 832.2 (2016), p. L21. DOI: 10.3847/2041-8205/832/2/L21. arXiv: 1607.07456 [astro-ph.HE]

Contributed Talks and Posters

Searching for p-g mode coupling in GW170817 **2019**
Talk at STAG Research Centre (South Hampton, United Kingdom)

Model Selection with Mult-Tempering Techniques **2019**
Talk at PyCBC Inference Conference (Portsmouth, United Kingdom)

Searching for measurable p-g mode instability in GW170817 **2019**
Talk at American Physical Society April 2019 meeting (Denver, Colorado)

Searching for p-g mode coupling in GW170817 **2018**
Poster at GWPAW 2018 (College Park, Maryland)

The Search for Gravitational Waves from Binaries with Neutron Stars **2017**
Talk at GWPAW 2017 (Annecy, France)

First Results from the Search for Binary Black Hole Coalescence with Advanced LIGO **2016**
Poster at Relativity and Gravitation: Contemporary Research and Teaching of Einstein's Physics, Gordon Research Conference.

Outreach

Lead Tour Guide at Holden Observatory **2015-Present**

Adopt-a-Physicist participant **2015, 2016**

Scholastic Dinosaur 13 Webinar Interview **2014**

Full Publication List

Abbott, B. P. et al. "A gravitational-wave standard siren measurement of the Hubble constant". In: *Nature* 551.7678 (2017), pp. 85–88. DOI: 10.1038/nature24471. arXiv: 1710.05835 [astro-ph.CO].

Abbott, B. P. et al. "Astrophysical Implications of the Binary Black-Hole Merger GW150914". In: *Astrophys. J.* 818.2 (2016), p. L22. DOI: 10.3847/2041-8205/818/2/L22. arXiv: 1602.03846 [astro-ph.HE].

— "Binary Black Hole Mergers in the first Advanced LIGO Observing Run". In: *Phys. Rev.* X6.4 (2016). [erratum: Phys. Rev.X8,no.3,039903(2018)], p. 041015. DOI: 10.1103/PhysRevX.6.041015,10.1103/PhysRevX.8.039903. arXiv: 1606.04856 [gr-qc].

— "Characterization of transient noise in Advanced LIGO relevant to gravitational wave signal GW150914". In: *Class. Quant. Grav.* 33.13 (2016), p. 134001. DOI: 10.1088/0264-9381/33/13/134001. arXiv: 1602.03844 [gr-qc].

— "Comprehensive all-sky search for periodic gravitational waves in the sixth science run LIGO data". In: *Phys. Rev.* D94.4 (2016), p. 042002. DOI: 10.1103/PhysRevD.94.042002. arXiv: 1605.03233 [gr-qc].

— "Directly comparing GW150914 with numerical solutions of Einstein's equations for binary black hole coalescence". In: *Phys. Rev.* D94.6 (2016), p. 064035. DOI: 10.1103/PhysRevD.94.064035. arXiv: 1606.01262 [gr-qc].

Abbott, B P et al. "Effects of data quality vetoes on a search for compact binary coalescences in Advanced LIGO's first observing run". In: *Class. Quant. Grav.* 35.6 (2018), p. 065010. DOI: 10.1088/1361-6382/aaaafa. arXiv: 1710.02185 [gr-qc].

Abbott, B. P. et al. "Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817". In: *Astrophys. J.* 850.2 (2017), p. L39. DOI: 10.3847/2041-8213/aa9478. arXiv: 1710.05836 [astro-ph.HE].

— "Gravitational Waves and Gamma-rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A". In: *Astrophys. J.* 848.2 (2017), p. L13. DOI: 10.3847/2041-8213/aa920c. arXiv: 1710.05834 [astro-ph.HE].

Abbott, B. P. et al. "GW150914: First results from the search for binary black hole coalescence with Advanced LIGO". In: *Phys. Rev.* D93.12 (2016), p. 122003. DOI: 10.1103/PhysRevD.93.122003. arXiv: 1602.03839 [gr-qc].

— "GW150914: Implications for the stochastic gravitational wave background from binary black holes". In: *Phys. Rev. Lett.* 116.13 (2016), p. 131102. DOI: 10.1103/PhysRevLett.116.131102. arXiv: 1602.03847 [gr-qc].

— "GW150914: The Advanced LIGO Detectors in the Era of First Discoveries". In: *Phys. Rev. Lett.* 116.13 (2016), p. 131103. DOI: 10.1103/PhysRevLett.116.131103. arXiv: 1602.03838 [gr-qc].

— "GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence". In: *Phys. Rev. Lett.* 116.24 (2016), p. 241103. DOI: 10.1103/PhysRevLett.116.241103. arXiv: 1606.04855 [gr-qc].

Abbott, B.. P.. et al. "GW170608: Observation of a 19-solar-mass Binary Black Hole Coalescence". In: *Astrophys. J.* 851.2 (2017), p. L35. DOI: 10.3847/2041-8213/aa9f0c. arXiv: 1711.05578 [astro-ph.HE].

Abbott, B. P. et al. "GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence". In: *Phys. Rev. Lett.* 119.14 (2017), p. 141101. DOI: 10.1103/PhysRevLett.119.141101. arXiv: 1709.09660 [gr-qc].

— "Localization and broadband follow-up of the gravitational-wave transient GW150914". In: *Astrophys. J.* 826.1 (2016), p. L13. DOI: 10.3847/2041-8205/826/1/L13. arXiv: 1602.08492 [astro-ph.HE].

Abbott, B. P. et al. "Multi-messenger Observations of a Binary Neutron Star Merger". In: *Astrophys. J.* 848.2 (2017), p. L12. DOI: 10.3847/2041-8213/aa91c9. arXiv: 1710.05833 [astro-ph.HE].

Abbott, B. P. et al. "Observation of Gravitational Waves from a Binary Black Hole Merger". In: *Phys. Rev. Lett.* 116.6 (2016), p. 061102. DOI: 10.1103/PhysRevLett.116.061102. arXiv: 1602.03837 [gr-qc].

— "Observing gravitational-wave transient GW150914 with minimal assumptions". In: *Phys. Rev.* D93.12 (2016). [Addendum: Phys. Rev.D94,no.6,069903(2016)], p. 122004. DOI: 10.1103/PhysRevD.94.069903, 10.1103/PhysRevD.93.122004. arXiv: 1602.03843 [gr-qc].

Abbott, B. P. et al. "On the Progenitor of Binary Neutron Star Merger GW170817". In: *Astrophys. J.* 850.2 (2017), p. L40. DOI: 10.3847/2041-8213/aa93fc. arXiv: 1710.05838 [astro-ph.HE].

Abbott, B. P. et al. "Properties of the Binary Black Hole Merger GW150914". In: *Phys. Rev. Lett.* 116.24 (2016), p. 241102. DOI: 10.1103/PhysRevLett.116.241102. arXiv: 1602.03840 [gr-qc].

— "Prospects for Observing and Localizing Gravitational-Wave Transients with Advanced LIGO, Advanced Virgo and KAGRA". In: *Living Rev. Rel.* 21.1 (2018), p. 3. DOI: 10.1007/s41114-018-0012-9, 10.1007/lrr-2016-1. arXiv: 1304.0670 [gr-qc].

— "Search for Gravitational Waves Associated with Gamma-Ray Bursts During the First Advanced LIGO Observing Run and Implications for the Origin of GRB 150906B". In: *Astrophys. J.* 841.2 (2017), p. 89. DOI: 10.3847/1538-4357/aa6c47. arXiv: 1611.07947 [astro-ph.HE].

Abbott, B. P. et al. "Search for Post-merger Gravitational Waves from the Remnant of the Binary Neutron Star Merger GW170817". In: *Astrophys. J.* 851.1 (2017), p. L16. DOI: 10.3847/2041-8213/aa9a35. arXiv: 1710.09320 [astro-ph.HE].

Abbott, B. P. et al. "Supplement: Localization and broadband follow-up of the gravitational-wave transient GW150914". In: *Astrophys. J. Suppl.* 225.1 (2016), p. 8. DOI: 10.3847/0067-0049/225/1/8. arXiv: 1604.07864 [astro-ph.HE].

— "Supplement: The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914". In: *Astrophys. J. Suppl.* 227.2 (2016), p. 14. DOI: 10.3847/0067-0049/227/2/14. arXiv: 1606.03939 [astro-ph.HE].

— "Tests of general relativity with GW150914". In: *Phys. Rev. Lett.* 116.22 (2016). [Erratum: Phys. Rev. Lett.121,no.12,129902(2018)], p. 221101. DOI: 10.1103/PhysRevLett.116.221101, 10.1103/PhysRevLett.121.129902. arXiv: 1602.03841 [gr-qc].

— "The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914". In: *Astrophys. J.* 833.1 (2016), p. L1. DOI: 10.3847/2041-8205/833/1/L1. arXiv: 1602.03842 [astro-ph.HE].

— "Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-Based Cross-Correlation Search in Advanced LIGO Data". In: *Astrophys. J.* 847.1 (2017), p. 47. DOI: 10.3847/1538-4357/aa86f0. arXiv: 1706.03119 [astro-ph.HE].

Abbott, Benjamin P. et al. "All-sky search for long-duration gravitational wave transients in the first Advanced LIGO observing run". In: *Class. Quant. Grav.* 35.6 (2018), p. 065009. DOI: 10.1088/1361-6382/aaab76. arXiv: 1711.06843 [gr-qc].

— "All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data". In: *Phys. Rev.* D96.6 (2017), p. 062002. DOI: 10.1103/PhysRevD.96.062002. arXiv: 1707.02667 [gr-qc].

Abbott, Benjamin P. et al. “All-sky search for short gravitational-wave bursts in the first Advanced LIGO run”. In: *Phys. Rev.* D95.4 (2017), p. 042003. DOI: 10.1103/PhysRevD.95.042003. arXiv: 1611.02972 [gr-qc].
— “Directional Limits on Persistent Gravitational Waves from Advanced LIGO’s First Observing Run”. In: *Phys. Rev. Lett.* 118.12 (2017), p. 121102. DOI: 10.1103/PhysRevLett.118.121102. arXiv: 1612.02030 [gr-qc].
— “Effects of waveform model systematics on the interpretation of GW150914”. In: *Class. Quant. Grav.* 34.10 (2017), p. 104002. DOI: 10.1088/1361-6382/aa6854. arXiv: 1611.07531 [gr-qc].
— “Exploring the Sensitivity of Next Generation Gravitational Wave Detectors”. In: *Class. Quant. Grav.* 34.4 (2017), p. 044001. DOI: 10.1088/1361-6382/aa51f4. arXiv: 1607.08697 [astro-ph.IM].
— “First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data”. In: *Phys. Rev.* D96.12 (2017), p. 122004. DOI: 10.1103/PhysRevD.96.122004. arXiv: 1707.02669 [gr-qc].
— “First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data”. In: *Phys. Rev.* D96.12 (2017). [Erratum: Phys. Rev.D97,no.12,129903(2018)], p. 122006. DOI: 10.1103/PhysRevD.96.122006,10.1103/PhysRevD.97.129903. arXiv: 1710.02327 [gr-qc].
— “First search for gravitational waves from known pulsars with Advanced LIGO”. In: *Astrophys. J.* 839.1 (2017). [Erratum: Astrophys. J.851,no.1,71(2017)], p. 12. DOI: 10.3847/1538-4357/aa9aee,10.3847/1538-4357/aa677f. arXiv: 1701.07709 [astro-ph.HE].
— “First search for nontensorial gravitational waves from known pulsars”. In: *Phys. Rev. Lett.* 120.3 (2018), p. 031104. DOI: 10.1103/PhysRevLett.120.031104. arXiv: 1709.09203 [gr-qc].
— “GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2”. In: *Phys. Rev. Lett.* 118.22 (2017). [Erratum: Phys. Rev. Lett.121,no.12,129901(2018)], p. 221101. DOI: 10.1103/PhysRevLett.118.221101,10.1103/PhysRevLett.121.129901. arXiv: 1706.01812 [gr-qc].
— “GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences”. In: *Phys. Rev. Lett.* 120.9 (2018), p. 091101. DOI: 10.1103/PhysRevLett.120.091101. arXiv: 1710.05837 [gr-qc].
— “Results of the deepest all-sky survey for continuous gravitational waves on LIGO S6 data running on the Einstein@Home volunteer distributed computing project”. In: *Phys. Rev.* D94.10 (2016), p. 102002. DOI: 10.1103/PhysRevD.94.102002. arXiv: 1606.09619 [gr-qc].
— “Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model”. In: *Phys. Rev.* D95.12 (2017), p. 122003. DOI: 10.1103/PhysRevD.95.122003. arXiv: 1704.03719 [gr-qc].
— “Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO”. In: *Phys. Rev.* D96.2 (2017), p. 022001. DOI: 10.1103/PhysRevD.96.022001. arXiv: 1704.04628 [gr-qc].
— “The basic physics of the binary black hole merger GW150914”. In: *Annalen Phys.* 529.1-2 (2017), p. 1600209. DOI: 10.1002/andp.201600209. arXiv: 1608.01940 [gr-qc].
— “Upper Limits on the Rates of Binary Neutron Star and Neutron Star–black Hole Mergers From Advanced Ligo’s First Observing run”. In: *Astrophys. J.* 832.2 (2016), p. L21. DOI: 10.3847/2041-8205/832/2/L21. arXiv: 1607.07456 [astro-ph.HE].
— “Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO’s First Observing Run”. In: *Phys. Rev. Lett.* 118.12 (2017). [Erratum: Phys.

Rev. Lett.119,no.2,029901(2017)], p. 121101. DOI: 10.1103/PhysRevLett.118.121101,10.1103/PhysRevLett.119.029901. arXiv: 1612.02029 [gr-qc].

Abbott, B.P. et al. "Constraints on cosmic strings using data from the first Advanced LIGO observing run". In: *Phys. Rev.* D97.10 (2018), p. 102002. DOI: 10.1103/PhysRevD.97.102002. arXiv: 1712.01168 [gr-qc].

— "GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral". In: *Phys. Rev. Lett.* 119.16 (2017), p. 161101. DOI: 10.1103/PhysRevLett.119.161101. arXiv: 1710.05832 [gr-qc].

Abbott, Thomas D. et al. "Improved analysis of GW150914 using a fully spin-precessing waveform Model". In: *Phys. Rev.* X6.4 (2016), p. 041014. DOI: 10.1103/PhysRevX.6.041014. arXiv: 1606.01210 [gr-qc].

— "Search for continuous gravitational waves from neutron stars in globular cluster NGC 6544". In: *Phys. Rev.* D95.8 (2017), p. 082005. DOI: 10.1103/PhysRevD.95.082005. arXiv: 1607.02216 [gr-qc].

Adrian-Martinez, S. et al. "High-energy Neutrino follow-up search of Gravitational Wave Event GW150914 with ANTARES and IceCube". In: *Phys. Rev.* D93.12 (2016), p. 122010. DOI: 10.1103/PhysRevD.93.122010. arXiv: 1602.05411 [astro-ph.HE].

Albert, A. et al. "Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory". In: *Astrophys. J.* 850.2 (2017), p. L35. DOI: 10.3847/2041-8213/aa9aed. arXiv: 1710.05839 [astro-ph.HE].

— "Search for High-energy Neutrinos from Gravitational Wave Event GW151226 and Candidate LVT151012 with ANTARES and IceCube". In: *Phys. Rev.* D96.2 (2017), p. 022005. DOI: 10.1103/PhysRevD.96.022005. arXiv: 1703.06298 [astro-ph.HE].

Nitz, Alexander H. et al. "1-OGC: The first open gravitational-wave catalog of binary mergers from analysis of public Advanced LIGO data". In: (2018). arXiv: 1811.01921 [gr-qc].

Nitz, Alexander H. et al. "Rapid detection of gravitational waves from compact binary mergers with PyCBC Live". In: *Phys. Rev.* D98.2 (2018), p. 024050. DOI: 10.1103/PhysRevD.98.024050. arXiv: 1805.11174 [gr-qc].

Reyes, Steven and Duncan A. Brown. "Constraints on non-linear tides due to *p-g* mode coupling from the neutron-star merger GW170817". In: (2018). arXiv: 1808.07013 [astro-ph.HE].