Nancy Aggarwal

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Work

CFP Postdoctoral Fellow
ARIADNE Collaboration, Geraci Group 2019–
Center for Fundamental Physics (CFP) , Northwestern University, Chicago (USA)

CIERA Postdoctoral Fellow
LIGO Collaboration, Kalogera Group 2019–
Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA) , Northwestern University, Chicago (USA)

Education

PhD in Physics **4.8/5**
Massachusetts Institute of Technology, Cambridge (USA) 2012–2019

Bachelor of Technology in Engineering Physics **8.9/10**
Indian Institute of Technology, Mumbai (India) 2007–2011
Additional Honours In Physics, Minor in Electrical Engineering

Awards and Honors

2019 GWIC Thesis Prize: awarded by Gravitational-Wave International Committee *2020*
Chandrasekhar award for best talk by a postdoc: Awarded by the ISGRG after talk at GR22 Conference *2019*
Poster prize: MIT Physics Graduate Open House Poster Session *2017*
Breakthrough prize: awarded for discovery of gravitational waves as a member of the LIGO team *2017*
Nature Nanotechnology poster pize: Frontiers of Nanomechanical Systems Conference *2017*
Poster award: Gordon Research Seminar on Mechanical Systems in Quantum Regime, 250$ cash *2016*
Graduate Woman of Excellence Award: for leadership towards change in physics qualifying exams at MIT *2015*
IIT Bombay Heritage Fund Scholarship: Cash prize awarded for excellent academic performance *2009*

Doctoral Thesis Research

Quantum optomechanics on a micro-mechanical chip
Prof. Nergis Mavalvala *Laser Interferometer Gravitational Wave Observatory(LIGO)*

Title: A room-temperature optomechanical squeezer (arXiv link)

Research on precision quantum measurements techniques to improve the sensitivity of gravitational wave detectors. Exploring the optomechanical coupling between mechanical states of small cantilevers on a chip and quantum states of laser light for this improvement.

- **Computer simulations of an optomechanically squeezed-light source**
  Numerically computed opto-mechanical squeezing and used my simulation to optimize the experiment's design to make a robust squeezed light source at room temperature.
- **Set up an experiment for measuring opto-mechanical squeezing**
  Designed and built a new lab with complex apparatus from bottom up – involves design and construction of vacuum, electronic, mechanical, optical and optoelectronic subsystems.
  Set up negligible loss optical and ultra-low noise electronics systems for quantum-limited measurements of squeezed light.

- **Quantum measurements at room temperature** Demonstrated first-ever measurement of quantum radiation pressure noise and optomechanical squeezing at room temperature.

Leadership, Teaching and Outreach Experience

Reviewer

For following journals

- Physical Review Letters
- Optics Letters
- Physical Review D

President

Physics Graduate Students' Council, MIT *2013-2014*

- Led a 20 member team with a budget of 15,000 USD, petitioned graduate students' needs to the department and the institute, and organised social events to improve the general environment.
- Conducted an extensive survey among the student body and analysed and presented its results to the department. It led to changes in departmental policies, including a revamp of qualifying exams.

Founder

Teach Me, Group for Rural Activities (GRA), IIT Bombay *2009-2011*

Founded an initiative called 'Teach Me' and led a team of 15 IITB female students to teach underprivileged kids. Devised new learning methods for their course curriculum along with focus on their overall personal and professional development. One of the girls we coached was admitted to IIT this year and will be pursuing a Physics major.

Teacher

Celebrating Einstein *Apr 2015*

Taught a course called "Einstein, Gravity and Curved Space" in a nearby High School as a part of celebrating 100th anniversary of Einstein's General Theory of Relativity

Teacher

MIT Educational Studies Program *2014-2015*

Designed and taught physics classes to high school students. Courses taught so far:

- All the Physics you can learn before Calculus 2
- The Physics of Quantum Measurements

Mentor

MIT *2012-2017*

Mentored 5 undergraduate and 2 high school summer interns at LIGO lab for their research projects.

Lecturer

IITian's Pace, FITJEE *2011-2012*

Coached students in Mumbai and Delhi for IIT-JEE, the examination for admission to IITs

Warden's Nominee

Women's Residence Hall, IITB *2010-2011*

Headed a 3-tier student council with a budget of INR 750,000 in a residence hall of 500 women.

Technical Mentor

Women's Residence Hall, IITB *2008-2010*

Selected for 2 years, helped create a culture of innovation and originality by mentoring female undergraduate students in robotics.

Projects

Academic

Research Intern, Advanced Interferometry

Prof. Rana Adhikari, CALTECH *Summer 2010*

Expanded and enhanced the control system for auto-alignment of a triangular cavity, made the system mathematically complete by installing a new quadrant photodiode to add more signals, which then enabled diagnolization of the control matrix. Report published in internal LIGO document and used by LIGO members.

Research Associate, LabAmp Project
Prof. Matthew Evans, MIT *Fall 2012*
Engineered a modular kit for quickly building simple or complex feedback filters. Report published in internal LIGO document and used by LIGO members.

Student, Rapid Prototyping
Prof. Niel Gershenfeld, MIT Media Labs *Sept 2013*
- **Press-fit Construction kit** Used the laser cutter to make a kit of pieces that fit together by pressing to make a sliced object
- **PCB Milling** Used small mills to fabricate PCBs in-house to get a faster turnaround on implementing simple electronic circuits

Prof. B.P. Singh
Senior Thesis, Quantum Dots Spectroscopy, IIT Bombay *Fall 2010*
Grew nanocrystals in inorganic materials to synthesize quantum dots in nanomaterials; studied them using fluorescence spectroscopy.

Robotics

ANTZ
Techfest 2010 *2010*
Implemented swarm robotics : engineered a system of robots, each with independent computing abilities, collectively completing a given task using wireless communication with each other and the master.

Nexus Commquest
Techfest 2009, 1st position *2009*
Built a robot that communicated wirelessly with the organisers and accomplished the received tasks by following an optimized path, while sending its progress to the organisers on its way.

RoboHolix
Technical General Championship, Women's Team *2009*
Made a robot which was able to splash water at the opponent's bot as well as protect itself from water attack. Implementation of the Indian festival of Holi.

RoboSoccer
Technical General Championship, Women's Team *2008*
Built a team of 3 remote-controlled robots which played soccer against robots of the opponent team.

NEXUS
Techfest Elims, Women's Team *2007*
Built a robot which picked up scattered blocks from the ground using a cloth drying clip, raised them and placed them behind a marked level on a platform.

Skills

Instrumentation: Precision optical systems, fiber optics, vacuum systems, in-vacuum opto-electronics

Electronics: Active and passive filters, feedback control systems, microprocessors like Atmega, Arduino

CAD, Programming & Simulation: Altium, Solidworks, COMSOL, Matlab, Mathematica, C/C++, Python

Fabrication: Lathe, mill, laser cutter, vinyl cutter, 3D printer, waterjet cutter

Presentations

Invited Talks

UC Louvain Seminar: Science case and design considerations for a high-frequency GW detector *2021*

Stanford Seminar: Gravitational waves at frequencies > 10 kHz *2021*

UniKORN Seminar: Room temperature optomechanical squeezing *2021*

KCL L&M Seminar: Precision measurements aiding gravitational waves and dark matter research *2021*

IAGRG Meeting Plenary: Precision measurements aiding gravitational waves and dark matter research *2020*

ICTS Seminar: Precision measurements aiding gravitational waves and dark matter research *2020*

IITB Seminar: Precision measurements aiding gravitational waves and dark matter research *2020*

UIUC Tea Time Talks: Precision measurements aiding gravitational waves and dark matter research *2020*
LVK Meeting Plenary: Optomechanical Squeezing *2020*
SPIE OPTO: Room temperature optomechanical squeezing *2020*
Hot Topics in Physics at CUWIP U-Chicago: Building the perfect headphones to hear the cosmic whisper *2020*
CIERA Jamboree: (Astro)physics with precision measurmeents *2019*
GRASS 2019: Room temperature optomechanical squeezing *2019*
SPIE Photonics + Optics: Room temperature optomechanichal squeezing *2019*
University College London: Room temperature optomechanical squeezing *2019*
Birmingham University: Room temperature optomechanical squeezing *2019*
Cardiff University: Room temperature optomechanical squeezing *2019*
GR22/Amaldi13: Room temperature optomechanical squeezing *2019*
Tel-Aviv University: Room temperature optomechanical squeezing *2019*
Bar Ilan University: Room temperature optomechanical squeezing *2019*
Northwestern University Brown Bag Seminar: Optomechanical squeezing *2019*
University of Vienna AMO Seminar: Optomechanical squeezing *2018*
U C Boulder JILA Seminar: Optomechanical squeezing *2018*
Stanford University AMO Seminar: Optomechanical squeezing *2018*
Northwestern University CFP Seminar: Optomechanical squeezing *2018*
U C Berkeley AMO Seminar: Optomechanical squeezing *2018*
MIT Museum: The Big Quantum *2017*
University of Western Australia: Optimizing the Design of Micro Cantilevers for Quantum Measurements *2017*
GW Advanced Detector Workshop: A broadband audio frequency OM squeezer at room temperature *2017*
SciFoo conference: Quantized Light: Are photons a friend or foe *2017*
MIT CoSi Public Lecture: Quantized Light - Are photons a friend or foe *2017*
IITB Physics Seminar: Towards Ponderomotive Squeezing using micro-cantilevers *2015*

Contributed Talks

GWADW 2021: Science case and design considerations for a high-frequency GW detector *2021*
APS April meeting: Optomechanical Squeezing *2019*
MIT Astrophysics Journal Club: Implications of GW170817 on the dark sector *2017*
MIT Astrophysics Grad Lunch: A broadband audio frequency OM squeezer at room temperature *2017*
MIT Astrophysics Grad Lunch: LIGO @ MIT - an interactive tour *2016*
Gordon Research Seminar: Discussion Leader – From LIGO to Quantum information *2016*
MIT Center for Ultracold Atoms Lunch: Towards Ponderomotive Squeezing using micro-cantilevers *2015*
MIT Astrophysics Grad Lunch: Introduction to Ponderomotive Squeezing *2015*
MIT Astrophysics Grad Lunch: Macroscopic systems in the Quantum Regime *2013*
MIT Astrophysics Grad Lunch: Towards Quantum Radiation Pressure in macroscopic systems *2013*

Posters

Aspen Conference on QIS for Fundamental Physics: *2020*
Progress on the Axion Resonant Interaction DetectioN Experiment (ARIADNE)
MIT Physics Open House: A broadband audio-frequency OM squeezer at room temperature *2017*
Frontiers of Nanomechanical Systems: A broadband audio-frequency OM squeezer at room temperature *2017*
Gordon Research Conference on Quantum Science: A room temperature audio frequency OM squeezer *2016*

LIGO Virgo Collaboration Meeting: A room temperature audio frequency OM squeezer *2016*
GRC Mechanical Systems in Quantum Regime: A room temperature audio frequency OM squeezer *2016*
Hybrid Quantum Systems: Optomechanics at Multiple Mass Scales *2014*
GRC Mechanical Systems in Quantum Regime: Optomechanics at Multiple Mass Scales *2014*
MIT Physics Open House: Quantum Noise in Advanced LIGO *2013*
MIT Physics Open House: Quantum Measurements at MIT *2013*

Publications

Up-to-date list of publications on Google Scholar.

Published short-author papers

Marina Trad Nery, Jasper R Venneberg, Nancy Aggarwal, et al. Laser power stabilization via radiation pressure. *Optics Letters*, 46(8):1946–1949, 2021.

Harry Fosbinder-Elkins, Younggeun Kim, Jordan Dargert, et al. A method for controlling the magnetic field near a superconducting boundary in the ariadne axion experiment. *Quantum Science and Technology*, 2021.

Chloe Lohmeyer, Nancy Aggarwal, Asimina Arvanitaki, et al. Source mass characterization in the ariadne axion experiment. In *Microwave Cavities and Detectors for Axion Research*, pages 71–81. Springer, 2020.

Vishnu Charan Suresh Kumar, Prateek Harne, Venkata Suresh Patthipati, et al. Wide-area transepithelial sampling in adjunct to forceps biopsy increases the absolute detection rates of barrett's oesophagus and oesophageal dysplasia: a meta-analysis and systematic review. *BMJ Open Gastroenterology*, 7(1):e000494, 2020.

Nancy Aggarwal, George P Winstone, Mae Teo, et al. Searching for new physics with a levitated-sensor-based gravitational-wave detector. *arXiv:2010.13157*, 2020.

Nancy Aggarwal, Allard Schnabel, Jens Voigt, et al. Characterization of magnetic field noise in the ariadne source mass rotor. *arXiv:2011.12617*, 2020.

Nancy Aggarwal, Torrey J Cullen, Jonathan Cripe, et al. Room-temperature optomechanical squeezing. *Nature Physics*, 16(7), 2020.

N Aggarwal, OD Aguiar, A Bauswein, et al. Challenges and Opportunities of Gravitational Wave Searches at MHz to GHz Frequencies. *Accepted in Living Reviews of Relativity*, arXiv:2011.12414, 2020.

Jonathan Cripe, Nancy Aggarwal, Robert Lanza, et al. Measurement of quantum back action in the audio band at room temperature. *Nature*, 568, 2019.

Jonathan Cripe, Nancy Aggarwal, Robinjeet Singh, et al. Radiation-pressure-mediated control of an optomechanical cavity. *Phys. Rev. A*, 97, 2018.

In preparation

N. Aggarwal, H. Miao, and N. Mavalvala. Optimizing the design of a broadband optomechanical squeezed source of light. *In Preparation*.

N Aggarwal and N Mavalvala. Closed loop response of an optomechanical cavity using classical physics. *In Preparation*.

N. Aggarwal, R. Lanza, J. Cripe, et al. Micro-mirrors for a broadband quantum measurement in the audio frequency band at room temperature. *In Preparation*.

Collaboration papers

Rich Abbott, Thomas D Abbott, Sheelu Abraham, et al. Open data from the first and second observing runs of advanced ligo and advanced virgo. *SoftwareX*, 13:100658, 2021.

R Abbott, TD Abbott, S Abraham, et al. Upper limits on the isotropic gravitational-wave background from advanced ligo's and advanced virgo's third observing run. *arXiv preprint arXiv:2101.12130*, 2021.

R Abbott, TD Abbott, S Abraham, et al. Search for anisotropic gravitational-wave backgrounds using data from advanced ligo's and advanced virgo's first three observing runs. *arXiv preprint arXiv:2103.08520*, 2021.

R Abbott, TD Abbott, S Abraham, et al. Constraints on cosmic strings using data from the third advanced ligo-virgo observing run. *arXiv preprint arXiv:2101.12248*, 2021.

R Abbott, TD Abbott, S Abraham, et al. All-sky search in early o3 ligo data for continuous gravitational-wave signals from unknown neutron stars in binary systems. *Physical Review D*, 103(6):064017, 2021.

BP Abbott, R Abbott, TD Abbott, et al. Vizier online data catalog: Search for gw signals associated with grbs (abbott+, 2019). *VizieR Online Data Catalog*, pages J–ApJ, 2021.

BP Abbott, R Abbott, TD Abbott, et al. A gravitational-wave measurement of the hubble constant following the second observing run of advanced ligo and virgo. *The Astrophysical Journal*, 909(2):218, 2021.

Shubhanshu Tiwari, R Abbott, TD Abbott, et al. Prospects for observing and localizing gravitational-wave transients with advanced ligo, advanced virgo and kagra. *Living Reviews in Relativity*, 23(1):3, 2020.

P Thomas, SR Thondapu, KA Thorne, et al. Gw190425: Observation of a compact binary coalescence with total mass similar to 3.4 m-circle dot. *ASTROPHYSICAL JOURNAL LETTERS*, 892(1), 2020.

R Hamburg, C Fletcher, E Burns, et al. A joint fermi-gbm and ligo/virgo analysis of compact binary mergers from the first and second gravitational-wave observing runs. *The Astrophysical Journal*, 893(2):100, 2020.

J Gniesmer, P Godwin, E Goetz, et al. Gw190412: Observation of a binary-black-hole coalescence with asymmetric masses. *PHYSICAL REVIEW D*, 102(4), 2020.

Ligo Scientific Collaboration, Virgo Collaboration, et al. Erratum: Searches for gravitational waves from known pulsars at two harmonics in 2015-2017 ligo data (astrophysical journal (2019) 879 (10. *Astrophysical Journal*, 899(2):170, 2020.

Rich Abbott, TD Abbott, S Abraham, et al. Population properties of compact objects from the second ligo-virgo gravitational-wave transient catalog. *arXiv preprint arXiv:2010.14533*, 2020.

R Abbott, TD Abbott, S Abraham, et al. Search for gravitational waves associated with gamma-ray bursts detected by fermi and swift during the ligo-virgo run o3a. *arXiv preprint arXiv:2010.14550*, 2020.

R Abbott, TD Abbott, S Abraham, et al. Properties and astrophysical implications of the 150 $m_\odot$ binary black hole merger gw190521. *The Astrophysical Journal Letters*, 900(1):L13, 2020.

R Abbott, TD Abbott, S Abraham, et al. Gw190814: gravitational waves from the coalescence of a 23 solar mass black hole with a 2.6 solar mass compact object. *The Astrophysical Journal Letters*, 896(2):L44, 2020.

R Abbott, TD Abbott, S Abraham, et al. Gw190521: A binary black hole merger with a total mass of 150 $m_\odot$. *Physical review letters*, 125(10):101102, 2020.

R Abbott, TD Abbott, S Abraham, et al. Gw190412: Observation of a binary-black-hole coalescence with asymmetric masses. *Physical Review D*, 102(4):043015, 2020.

R Abbott, TD Abbott, S Abraham, et al. Tests of general relativity with binary black holes from the second ligo-virgo gravitational-wave transient catalog. *arXiv preprint arXiv:2010.14529*, 2020.

R Abbott, TD Abbott, S Abraham, et al. Gwtc-2: Compact binary coalescences observed by ligo and virgo during the first half of the third observing run. *arXiv preprint arXiv:2010.14527*, 2020.

R Abbott, TD Abbott, S Abraham, et al. Diving below the spin-down limit: Constraints on gravitational waves from the energetic young pulsar psr j0537-6910. *arXiv preprint arXiv:2012.12926*, 2020.

BP Abbott, R Abbott, TD Abbott, et al. Optically targeted search for gravitational waves emitted by core-collapse supernovae during the first and second observing runs of advanced ligo and advanced virgo. *Physical Review D*, 101(8):084002, 2020.

BP Abbott, R Abbott, TD Abbott, et al. Vizier online data catalog: 2015-2017 ligo obs. analysis for 221 pulsars (abbott+, 2019). *VizieR Online Data Catalog*, pages J–ApJ, 2020.

BP Abbott, R Abbott, TD Abbott, et al. Gw190425: observation of a compact binary coalescence with total mass 3.4 $m_{\odot}$. *The Astrophysical Journal Letters*, 892(1):L3, 2020.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. Model comparison from ligo–virgo data on gw170817's binary components and consequences for the merger remnant. *Classical and Quantum Gravity*, 37(4):045006, 2020.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. A guide to ligo–virgo detector noise and extraction of transient gravitational-wave signals. *Classical and Quantum Gravity*, 37(5):055002, 2020.

B Abbott, R Abbott, T Abbott, et al. Mgw190425: observation of a compact binary coalescence with total mass 3.4 $m_{\odot}$. 2020.

Carla M Startin, Sarah Hamburg, Rosalyn Hithersay, et al. Cognitive markers of preclinical and prodromal alzheimer's disease in down syndrome. *Alzheimer's & Dementia*, 15(2):245–257, 2019.

Marcelle Soares-Santos, Antonella Palmese, W Hartley, et al. First measurement of the hubble constant from a dark standard siren using the dark energy survey galaxies and the ligo/virgo binary–black-hole merger gw170814. *The Astrophysical Journal Letters*, 876(1):L7, 2019.

LIGO Scientific, BP Abbott, R Abbott, et al. Search for the isotropic stochastic background using data from advanced ligo's second observing run. *Physical Review D*, 100(6):061101, 2019.

David Reitze, Rich Abbott, Carl Adams, et al. The us program in ground-based gravitational wave science: contribution from the ligo laboratory. *arXiv preprint arXiv:1903.04615*, 2019.

Eric Burns, A Goldstein, CM Hui, et al. A fermi gamma-ray burst monitor search for electromagnetic signals coincident with gravitational-wave candidates in advanced ligo's first observing run. *The Astrophysical Journal*, 871(1):90, 2019.

Arnaud Albert, Michel André, Marco Anghinolfi, et al. Search for multimessenger sources of gravitational waves and high-energy neutrinos with advanced ligo during its first observing run, antares, and icecube. *The Astrophysical Journal*, 870(2):134, 2019.

Nancy Aggarwal, Jonathan Cripe, Robert Lanza, et al. Measurement of quantum back action in the audio band at room temperature. In *APS April Meeting Abstracts*, volume 2019, pages K01–056, 2019.

Nancy Aggarwal, Sam Barnum, Lisa Barsotti, et al. Properties of the binary neutron star merger gw170817. 2019.

BP Abbott, Richard Abbott, TD Abbott, et al. All-sky search for short gravitational-wave bursts in the second advanced ligo and advanced virgo run. *Physical Review D*, 100(2):024017, 2019.

BP Abbott, Richard Abbott, TD 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(3):031040, 2019.

BP Abbott, R Abbott, TD Abbott, et al. Properties of the binary neutron star merger gw170817. *Physical Review X*, 9(1):011001, 2019.

BP Abbott, R Abbott, TD Abbott, et al. Constraining the p-mode–g-mode tidal instability with gw170817. *Physical review letters*, 122(6):061104, 2019.

BP Abbott, R Abbott, TD Abbott, et al. Binary black hole population properties inferred from the first and second observing runs of advanced ligo and advanced virgo. *The Astrophysical Journal Letters*, 882(2):L24, 2019.

BP Abbott, R Abbott, TD Abbott, et al. Uws academic portal. *PHYSICAL REVIEW X Phys Rev X*, 9:011001, 2019.

Benjamin P Abbott, Richard Abbott, TD Abbott, et al. Search for gravitational waves from a long-lived remnant of the binary neutron star merger gw170817. *The Astrophysical Journal*, 875(2):160, 2019.

Benjamin P Abbott, Richard Abbott, TD Abbott, et al. Narrow-band search for gravitational waves from known pulsars using the second ligo observing run. *Physical Review D*, 99(12):122002, 2019.

Benjamin P Abbott, Richard Abbott, TD Abbott, et al. Searches for continuous gravitational waves from 15 supernova remnants and fomalhaut b with advanced ligo. *The Astrophysical Journal*, 875(2):122, 2019.

Benjamin P Abbott, Richard Abbott, TD Abbott, et al. Low-latency gravitational-wave alerts for multimessenger astronomy during the second advanced ligo and virgo observing run. *The Astrophysical Journal*, 875(2):161, 2019.

Benjamin P Abbott, R Abbott, TD Abbott, et al. Tests of general relativity with gw170817. *Physical review letters*, 123(1):011102, 2019.

Benjamin P Abbott, R Abbott, TD Abbott, et al. Directional limits on persistent gravitational waves using data from advanced ligo's first two observing runs. *Physical Review D*, 100(6):062001, 2019.

Jonathan Cripe, Nancy Aggarwal, Robert Lanza, et al. Observation of a room-temperature oscillator's motion dominated by quantum fluctuations over a broad audio-frequency band. *arXiv preprint arXiv:1802.10069*, 2018.

Nancy Aggarwal, Lisa Barsotti, Sebastien Biscans, et al. Gw170814: A three-detector observation of gravitational waves from a binary black hole coalescence. 2018.

Nancy Aggarwal, Lisa Barsotti, Sebastien Biscans, et al. All-sky search for long-duration gravitational wave transients in the first advanced ligo observing run. 2018.

Benjamin P Abbott, Robert Abbott, Thomas D Abbott, et al. First search for nontensorial gravitational waves from known pulsars. *Physical review letters*, 120(3):031104, 2018.

Benjamin P Abbott, Robert Abbott, Thomas D Abbott, et al. All-sky search for long-duration gravitational wave transients in the first advanced ligo observing run. *Classical and Quantum Gravity*, 35(6):065009, 2018.

Benjamin P Abbott, Richard Abbott, Thomas D Abbott, et al. Search for tensor, vector, and scalar polarizations in the stochastic gravitational-wave background. *Physical review letters*, 120(20):201102, 2018.

Benjamin P Abbott, Richard Abbott, Thomas D Abbott, et al. Effects of data quality vetoes on a search for compact binary coalescences in advanced ligo's first observing run. *Classical and Quantum Gravity*, 35(6):065010, 2018.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. Gw170817: implications for the stochastic gravitational-wave background from compact binary coalescences. *Physical review letters*, 120(9):091101, 2018.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. Full band all-sky search for periodic gravitational waves in the o1 ligo data. *Physical Review D*, 97(10):102003, 2018.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. Constraints on cosmic strings using data from the first advanced ligo observing run. *Physical Review D*, 97(10):102002, 2018.

The LIGO Scientific Collaboration and Virgo Collaboration. The basic physics of the binary black hole merger GW150914. *Ann. Phys.*, 529(1-2) 2017.

LIGO Scientific Collaboration and J Harms. Exploring the sensitivity of next generation gravitational wave detectors. *Class. Quantum Gravity*, 34(4):044001 2017.

LIGO Scientific Collaboration, Virgo Collaboration, and The IPN Collaboration. Search for Gravitational Waves Associated with Gamma-Ray Bursts during the First Advanced LIGO Observing Run and Implications for the Origin of GRB 150906B. *Astrophys. J.*, 841(2):89 2017.

LIGO Scientific Collaboration, Virgo Collaboration, 1M2H Collaboration, et al. A gravitational-wave standard siren measurement of the hubble constant. *Nature*, 551(7678):85–88, 2017.

LIGO Scientific Collaboration, Virgo Collaboration, S. Buchner, et al. First Search for Gravitational Waves from Known Pulsars with Advanced LIGO. *Astrophys. J.*, 839(1):12 2017.

LIGO Scientific Collaboration, Virgo Collaboration, Michael Boyle, et al. Effects of waveform model systematics on the interpretation of GW150914. *Class. Quantum Gravity*, 34(10):104002 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO's First Observing Run. *PRL*, 118(12):121101 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-Based Cross-Correlation Search in Advanced LIGO Data 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model. *PRD*, 95(12):122003 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Search for continuous gravitational waves from neutron stars in globular cluster NGC 6544. *PRD*, 95(8):082005 2017.

LIGO Scientific Collaboration and Virgo Collaboration. GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2. *PRL*, 118(22):221101 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Directional Limits on Persistent Gravitational Waves from Advanced LIGO's First Observing Run. *PRL*, 118(12):121102 2017.

LIGO Scientific Collaboration and Virgo Collaboration. Calibration of the Advanced LIGO detectors for the discovery of the binary black-hole merger GW150914. *PRD*, 95(6):062003 2017.

LIGO Scientific Collaboration and Virgo Collaboration. All-sky search for short gravitational-wave bursts in the first Advanced LIGO run. *PRD*, 95(4):042003 2017.

M Barsuglia, D Barta, SD Barthelmy, et al. Gw170817: Observation of gravitational waves from a binary neutron star inspiral. *PHYSICAL REVIEW LETTERS*, 119(16), 2017.

A Albert, Michel André, M Anghinolfi, et al. Search for high-energy neutrinos from gravitational wave event gw151226 and candidate lvt151012 with antares and icecube. *Physical Review D*, 96(2):022005, 2017.

Neerja Aggarwal, Aaron Buikema, Frederick J Donovan, et al. Estimating the contribution of dynamical ejecta in the kilonova associated with gw170817. 2017.

Nancy Aggarwal, Lisa Barsotti, Sebastien Biscans, et al. Search for post-merger gravitational waves from the remnant of the binary neutron star merger gw170817. 2017.

Nancy Aggarwal, Lisa Barsotti, Sebastien Biscans, et al. Gravitational waves and gamma-rays from a binary neutron star merger: Gw170817 and grb 170817a. 2017.

Nancy Aggarwal, Lisa Barsotti, Sebastien Biscans, et al. Upper limits on gravitational waves from scorpius x-1 from a model-based cross-correlation search in advanced ligo data. 2017.

BP Abbott, R Abbott, TD Abbott, et al. Vizier online data catalog: Gravitational waves search from known psr with ligo (abbott+, 2017). *VizieR Online Data Catalog*, pages J–ApJ, 2017.

BP Abbott, R Abbott, TD Abbott, et al. Erratum:"first search for gravitational waves from known pulsars with advanced ligo"(2017, apj, 839, 12). *The Astrophysical Journal*, 851(1):71, 2017.

Benjamin P Abbott, S Bloemen, P Canizares, et al. Multi-messenger observations of a binary neutron star merger. 2017.

Benjamin P Abbott, Robert Abbott, TD Abbott, et al. Estimating the contribution of dynamical ejecta in the kilonova associated with gw170817. *The Astrophysical Journal Letters*, 850(2):L39, 2017.

Benjamin P Abbott, Robert Abbott, TD Abbott, et al. Gravitational waves and gamma-rays from a binary neutron star merger: Gw170817 and grb 170817a. *The Astrophysical Journal Letters*, 848(2):L13, 2017.

Benjamin P Abbott, Richard Abbott, Thomas D Abbott, et al. Exploring the sensitivity of next generation gravitational wave detectors. *Classical and Quantum Gravity*, 34(4):044001, 2017.

Benjamin P Abbott, Richard Abbott, TD Abbott, et al. Gw170814: a three-detector observation of gravitational waves from a binary black hole coalescence. *Physical review letters*, 119(14):141101, 2017.

Benjamin P Abbott, Rich Abbott, Thomas D Abbott, et al. Search for intermediate mass black hole binaries in the first observing run of advanced ligo. *Physical Review D*, 96(2):022001, 2017.

Benjamin P Abbott, Rich Abbott, TD Abbott, et al. Gw170817: observation of gravitational waves from a binary neutron star inspiral. *Physical Review Letters*, 119(16):161101, 2017.

Benjamin P Abbott, R Abbott, TD Abbott, et al. Gw170608: observation of a 19 solar-mass binary black hole coalescence. *The Astrophysical Journal Letters*, 851(2):L35, 2017.

Benjamin P Abbott, R Abbott, TD Abbott, et al. On the progenitor of binary neutron star merger gw170817. *The Astrophysical Journal Letters*, 850(2):L40, 2017.

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