

Department of Physics, Enrico Fermi Institute,
Department of Astronomy & Astrophysics, and
Kavli Institute for Cosmological Physics
University of Chicago, Chicago IL 60637
danielholz.com



EDUCATION

Princeton University

A.B., Physics *cum laude*, Spring 1992

University of Chicago

M.S., Physics, Fall 1994

Ph.D., Physics, Summer 1998

EXPERIENCE

Professor (2018—)

Enrico Fermi Institute, Department of Physics, Department of Astronomy & Astrophysics,
and Kavli Institute for Cosmological Physics, University of Chicago

Associate Professor (2015–2018)

Enrico Fermi Institute, Department of Physics, Department of Astronomy & Astrophysics,
and Kavli Institute for Cosmological Physics, University of Chicago

Assistant Professor (2011–2014)

Enrico Fermi Institute, Department of Physics, and Kavli Institute for Cosmological Physics,
The University of Chicago

Staff Member (2007–2011)

Theoretical Division, Los Alamos National Laboratory, Los Alamos, New Mexico

Feynman Fellow (2004–2007)

Theoretical Division, Los Alamos National Laboratory, Los Alamos, New Mexico

Center Fellow (2003–2004)

Center for Cosmological Physics, University of Chicago, Chicago, Illinois

KITP Fellow (2000–2003)

Kavli Institute for Theoretical Physics, University of California, Santa Barbara, California

Postdoctoral Fellow (1998–99)

Albert Einstein Institute, Max-Planck-Institut für Gravitationsphysik, Potsdam, Germany

FELLOWSHIPS AND AWARDS

Fellow of the American Physical Society (2017)

Kavli Fellow (2017)

Frontiers of Science, National Academy of Sciences

Breakthrough Prize in Fundamental Physics (2016)

awarded to the LIGO collaboration

Gruber Cosmology Prize (2016)

awarded to the LIGO collaboration

Quantrell Award for Excellence in Undergraduate Teaching (2015)

RECENT GRANTS

NSF Award PHY-2110507, PI

From One to Many: Statistical Gravitational-Wave Astrophysics and Cosmology; 2021–2024

NSF Award PHY-2006645, PI

WoU-MMA: Gravitational Wave Cosmology with Tidal Love Numbers; 2020–2023

NSF Award PHY-2011997, PI

From Single to Statistical: The Dawn of GW Astrophysics and Cosmology; 2020–2021

NSF Award PHY-1708081, PI

From First Detections to Gravitational-Wave Astrophysics; 2017–2020

NSF CAREER Award PHY-1151836, PI

Hearing and Seeing the Universe Through Multi-Messenger Astronomy; 2012–2017

SERVICE/OUTREACH

Bulletin of the Atomic ScientistsChair of the Science and Security Board of The Bulletin of the Atomic Scientists, which sets the time of the Doomsday Clock**University of Chicago Existential Risk Laboratory (XLab)**

Founder and director

Chair-line, American Physical Society Division of Astrophysics (2020–2023)**Chair-line, American Physical Society Division of Gravitation (2012–2015)****Committees/Panels**National Academy Astro2020 Decadal Report, member of the

Panel on Compact Objects and Energetic Phenomena (2019–2020)

UChicago KICP and Astronomy & Astrophysics Ombudsperson (2022—)

UChicago Provost Faculty Diversity Liason (2019–2022)

APS April Meeting Program Committee Chair (2016–17)

UChicago Physics Department Climate Committee Chair (2015–16)

UChicago Society of Women in Physics Faculty Advisor (2015–18)

UChicago Physical Sciences Teaching Committee (2013–2018)

UChicago KICP Fellows Lead (2011–2018)

UChicago Provost Faculty Working Group for African Institute for

Mathematical Sciences (AIMS) (2015–16)

UChicago Computations in Science seminar series co-organizer (2013–2019)

APS Task Force on Meetings (2013–14)

NSF review panels (astronomy & gravity, 5 panels over last 10 years)

Meetings/Conferences (principal organizer)KICP Workshop, “The Quest for Precision Gravitational-Wave Cosmology”, Chicago 2022Aspen Winter Conference, “Astrophysics with Gravitational-Wave Populations”, Aspen 2019KITP Program, “The New Era of GW Physics and Astrophysics”, Santa Barbara 2019Aspen Winter Conference, “Dawning Era of Gravitational-Wave Astrophysics”, Aspen 2017

APS April Meeting, Chair of entire conference (> 1,200 talks), Washington D.C. 2017

KITP Rapid Response Workshop, “Astrophysics from LIGO’s first black holes”, KITP 2016COSMO-14, Chicago 2014LIGO GW-Astronomy LoI meeting, Chicago 2013APS April Meeting, organized 23 sessions, Denver 2013

SERVICE/OUTREACH (continued)

Miscellaneous Outreach

Media: NPR Science Friday, New York Times, WTTW television, Quanta, Nature, WGN,
Science News, Symmetry Magazine, USA Today, Scientific American, UPI

Warrior-Scholar Project, UChicago STEM week principal organizer and lecturer (2021–),
 Public lectures including Life-Long Learning, Pint of Science, REU, Biblioteca Pública in the
 Azores, Mind Museum in Manila

TIME for Kids (2020)

STEM World conference plenary speaker (2020)

Afrofuturism Symposium, “Black quantum futurism and time travel” panel (2018)

PBS video: “Gravitational Waves 101: How to Hear the Universe” (2016)

“Conveying Gravity: Communicating the Discovery of Gravitational Waves”

APS News **25**, 8 (The Back Page) (2016)

Public lecture at screening of “Gravity” (2014), “Interstellar” (2015)

Public Dialog “Black Holes Whisper Sweet Somethings”, Aspen Center for Physics (2014)
cosmicvariance.com (2007–2011)

Heinz R. Pagels Memorial Public Lecture (2011), “Listening to the Universe with Gravitational
 Waves”, Aspen Center for Physics

Appearance on Stephen Hawking’s Universe, six episode BBC documentary

STUDENTS/POSTDOCS

Colm Talbot (2023–): Schmidt Fellow at UChicago

Tom Callister (2022–): KICP Fellow at UChicago

Amanda Farah (2019–): UChicago graduate student

Alexandra Hanselman (2020–): UChicago graduate student

Sam Dyson (2021–): UChicago graduate student

Mike Zevin (2020–2023): Hubble Fellow at UChicago.

Staff astrophysicist at the Adler Planetarium

Jose María Ezquiaga (2019–2022): Einstein Fellow at UChicago.

Assistant Professor at the Niels Bohr Institute

Maya Fishbach (2015–2020): UChicago graduate student. Einstein Fellow at Northwestern.

Assistant Professor at CITA

Reed Essick (2017–2020): KICP Fellow at UChicago.

Assistant Professor at the University of Toronto

Phil Landry (2017–2019): NSERC Fellow at UChicago. Now CITA Fellow

Zoheyr Doctor (2014–2019): UChicago graduate student.

Board of Visitors Research Assistant Professor at Northwestern

Ben Farr (2014–2017): McCormick Postdoctoral Fellow.

Assistant Professor at the University of Oregon

Hsin-Yu Chen (2010–2017): UChicago graduate student. Einstein Fellow at MIT.

Assistant Professor at the UT Austin

TEACHING

Are we doomed? (BPRO 258; Spring 2021, 2023), co-taught with James Evans

Gravitational Waves (ASTR 384; Winter 2021)

Spacetime and Black Holes (PHYS 264; Fall 2012, 2013, 2016, 2022)

Everyday Physics (PHSC 113; Winter 2013, co-taught with Bob Geroch)

Spacetime, Black holes, Gravitational Waves, & Cosmology

(PHYS 264/265; 2 quarter sequence 2014/15, 2015/16, 2019/20, 2021/22)

The Teaching & Learning of Physics (PHYS 300; Fall 2016)

Gravitational Waves (PHYS 460; Fall 2017)

CITATIONS (as of 9/2023; excluding LIGO papers without significant contributions)

of citations: > 100,000

h-index: > 115

Click [here](#) for all of my papers, *excluding* all LIGO collaboration papers.

Click [here](#) for a complete list of all of my publications.

PUBLICATIONS (excluding LIGO collaboration papers; click on titles for articles)

1. **Spin dynamics of the LAGEOS satellite in support of a measurement of the Earth's gravitomagnetism**
S. Habib, D.E. Holz, A. Kheyfets, R.A. Matzner, W.A. Miller, & B.W. Tolman
Phys. Rev. **D50**, 6068 (1994)
2. **The issue of time evolution in quantum gravity**
A. Kheyfets, D.E. Holz, & W.A. Miller
Int. J. Mod. Phys. **A11**, 2977 (1996)
3. **Photon statistics limits for Earth-based parallax measurements of MACHO events**
D.E. Holz & R.M. Wald
Astrophys. J. **471**, 64 (1996)
4. **A new method for determining cumulative gravitational lensing effects in inhomogeneous universes**
D.E. Holz & R.M. Wald
Phys. Rev. **D58**, 063501 (1998)
5. **Lensing and high-*z* supernova surveys**
D.E. Holz
Astrophys. J. Lett. **506**, L1 (1998)
6. **Gravitational lensing limits on the average redshift of gamma-ray bursts**
D.E. Holz, M.C. Miller, & J.M. Quashnock
Astrophys. J. **510**, 54 (1999)
7. **Apparent horizons in simplicial Brill wave initial data**
A.P. Gentle, D.E. Holz, W.A. Miller, & J.A. Wheeler
Class. Quant. Grav. **16**, 1979 (1999)
8. **Limits on the density of compact objects from high redshift supernovae**
U. Seljak & D.E. Holz
Astron. Astroph. Lett. **351**, L10 (1999)
9. **Symmetry without symmetry: numerical simulation of axisymmetric systems using Cartesian grids**
M. Alcubierre, S. Brandt, B. Bruegmann, D.E. Holz, E. Seidel, R. Takahashi, J. Thornburg
Int. J. Mod. Phys. **D10**, 273 (2001)
10. **Constant crunch coordinates for black hole simulations**
A.P. Gentle, D.E. Holz, A. Kheyfets, P. Laguna, W.A. Miller, & D.M. Shoemaker
Phys. Rev. **D63**, 064024 (2001)
11. **Seeing double: strong gravitational lensing of high-redshift supernovae**
D.E. Holz
Astrophys. J. Lett. **556**, L71 (2001)

...publications continued next page...

PUBLICATIONS (click on titles to link to articles)

12. **Collisional dark matter and scalar phantoms**
D.E. Holz & A. Zee
Phys. Lett. **B517**, 239 (2001)
13. **Gravitational wave emission from core-collapse of massive stars**
C.L. Fryer, D.E. Holz, & S.A. Hughes
Astrophys. J. **565**, 430 (2002)
14. **Hydrostatic expansion and spin changes during Type I X-ray bursts**
A. Cumming, S.M. Morsink, L. Bildsten, J.L. Friedman, & D.E. Holz
Astrophys. J. **564**, 343 (2002)
15. **A universal probability distribution function for weak-lensing amplification**
Y. Wang, D.E. Holz, & D. Munshi
Astrophys. J. Lett. **572**, L15 (2002)
16. **Retro-MACHOs: π in the sky?**
D.E. Holz & J.A. Wheeler
Astrophys. J. **578**, 330 (2002); featured in *Nature*, *Science*
17. **On the remarkable spectrum of a non-Hermitian random matrix model**
D.E. Holz, H. Orland, & A. Zee
J. Phys. A **36**, 3385 (2003)
18. **Corrective lenses for high redshift supernovae**
N. Dalal, D.E. Holz, X. Chen, & J.A. Frieman
Astrophys. J. Lett. **585**, L11 (2003)
19. **How black holes get their kicks: gravitational radiation recoil revisited**
M. Favata, S.A. Hughes, & D.E. Holz
Astrophys. J. Lett. **607**, L5 (2004)
20. **Consequences of gravitational radiation recoil**
D. Merritt, M. Milosavljević, M. Favata, S.A. Hughes, & D.E. Holz
Astrophys. J. Lett. **607**, L9 (2004)
21. **Gravitational waves from stellar collapse: correlations to explosion asymmetries**
C.L. Fryer, D.E. Holz, & S.A. Hughes
Astrophys. J. **609**, 288 (2004)
22. **Using gravitational-wave standard sirens**
D.E. Holz & S.A. Hughes
Astrophys. J. **629**, 15 (2005)
23. **Safety in numbers: Gravitational lensing degradation of the luminosity distance-redshift relation**
D.E. Holz & E.V. Linder
Astrophys. J. **631**, 678 (2005)
24. **Precision determination of the mass function of dark matter halos**
M.S. Warren, K. Abazajian, D.E. Holz, L. Teodoro
Astrophys. J. **646**, 881 (2006)
25. **Cosmology from supernova magnification maps**
A. Cooray, D.E. Holz, & D. Huterer
Astrophys. J. Lett. **637**, L77 (2006)

...publications continued next page...

PUBLICATIONS (click on titles to link to articles)

-
26. **Problems with pencils: lensing covariance of supernova distance measurements**
A. Cooray, D. Huterer, & D.E. Holz
Phys. Rev. Lett. **96**, 021301 (2006)
 27. **Short GRB and binary black hole standard sirens as a probe of dark energy**
N. Dalal, D.E. Holz, S.A. Hughes, B. Jain
Phys. Rev. D **74**, 063006 (2006)
 28. **The clustering of massive halos**
A.R. Wetzel, J.D. Cohn, M. White, D.E. Holz, & M.S. Warren
Astrophys. J., **656**, 139 (2007)
 29. **Direct reconstruction of the dark energy scalar-field potential**
C. Li, D.E. Holz, & A. Cooray
Phys. Rev. D, **75**, 103503 (2007)
 30. **A new population of high redshift short-duration gamma-ray bursts**
E. Berger, D.B. Fox, P.A. Price, E. Nakar, A. Gal-Yam, D.E. Holz, et al.
Astrophys. J. **664**, 1000 (2007)
 31. **Narrowing constraints with type Ia supernovae: converging on a cosmological constant**
S. Sullivan, A. Cooray, & D.E. Holz
J. Cosmology Astropart. Phys. **09**, 4 (2007)
 32. **CMB cluster lensing: Cosmography with the longest lever arm**
W. Hu, D.E. Holz, & C. Vale
Phys. Rev. D (Rapid Communications) **76**, 127301 (2007)
 33. **Lensing and supernovae: quantifying the bias on the dark energy equation of state**
D. Sarkar, A. Amblard, D.E. Holz, & A. Cooray
Astrophys. J. **678**, 1 (2008)
 34. **Close pairs as proxies for galaxy cluster mergers**
A. R. Wetzel, A.E. Schulz, D.E. Holz, & M.S. Warren
Astrophys. J. **683**, 1 (2008)
 35. **Beyond two dark energy parameters**
D. Sarkar, S. Sullivan, S. Joudaki, A. Amblard, D.E. Holz, & A. Cooray
Phys. Rev. Lett. **100**, 241302 (2008)
 36. **Toward a halo mass function for precision cosmology**
J. Tinker, A. Kravtsov, A. Klypin, K. Abazajian, M. Warren, G. Yepes, S. Gottlober, D.E. Holz
Astrophys. J. **688**, 709 (2008)
 37. **Implications of Two Type Ia Supernova Populations for Cosmological Measurements**
D. Sarkar, A. Amblard, A. Cooray, D.E. Holz
Astrophys. J. Lett. **684**, L13 (2008)
 38. **No evidence for dark energy dynamics from a global analysis of cosmological data**
P. Serra, A. Cooray, D.E. Holz, A. Melchiorri, P. Stefania, & D. Sarkar
Phys. Rev. D **80**, 121302 (2009)
 39. **Weak lensing and dark energy: the impact of dark energy on nonlinear dark matter clustering**
S. Joudaki, A. Cooray, & D.E. Holz
Phys. Rev. D **80**, 023003 (2009)

...publications continued next page...

PUBLICATIONS (click on titles to link to articles)

-
40. **Ultra-high precision cosmology from gravitational waves**
C. Cutler & D.E. Holz
Phys. Rev. D **80**, 104009 (2009)
 41. **On The Origin Of The Highest Redshift Gamma-Ray Bursts**
K. Belczynski, D.E. Holz, C.L. Fryer, E. Berger, D.H. Hartmann, & B. O'Shea
Astrophys. J. **708**, 117 (2010)
 42. **The effect of metallicity on the detection prospects for gravitational waves**
K. Belczynski, M. Dominik, T. Bulik, R. O'Shaughnessy, C. Fryer, & D.E. Holz
Astrophys. J. Lett **715**, 138 (2010)
 43. **Reducing the weak lensing noise for the gravitational wave Hubble diagram using the non-Gaussianity of the magnification distribution**
C.M. Hirata, D.E. Holz, & C. Cutler
Phys. Rev. D **81**, 124046 (2010)
 44. **Measuring dark energy spatial inhomogeneity with supernova data**
A. Cooray, D.E. Holz, & R. Caldwell
JCAP **11**, 015 (2010)
 45. **Exploring short gamma-ray bursts as gravitational-wave standard sirens**
S. Nissanke, D.E. Holz, S.A. Hughes, N. Dalal, & J.L. Sievers
Astrophys. J. **725**, 496 (2010)
 46. **Outflowing Galactic Winds in Post-starburst and AGN Host Galaxies at $0.2 < z < 0.8$**
A.L. Coil, B.J. Weiner, D.E. Holz, M.C. Cooper, R. Yan, & J. Aird
Astrophys. J. **743**, 46 (2011)
 47. **Localizing compact binary inspirals on the sky using ground-based gravitational wave interferometers**
S.M. Nissanke, J.L. Sievers, N. Dalal, & D.E. Holz
Astrophys. J. **739**, 99 (2011)
 48. **Compact Remnant Mass Function: Dependence on the Explosion Mechanism and Metallicity**
C.L. Fryer, K. Belczynski, G. Wiktorowicz, M. Dominik, V. Kalogera, & D.E. Holz
Astrophys. J. **749**, 91 (2012)
 49. **Evidence for Type Ia Supernova Diversity from Ultraviolet Observations with the Hubble Space Telescope**
X. Wang et al.
Astrophys. J. **749**, 126 (2012)
 50. **Double Compact Objects I: The Significance Of The Common Envelope On Merger Rates**
M. Dominik, K. Belczynski, C. Fryer, D.E. Holz, E. Berti, et al.
Astrophys. J. **759** 52 (2012)
 51. **Missing Black Holes Unveil the Supernova Explosion Mechanism**
K. Belczynski, G. Wiktorowicz, C. Fryer, D.E. Holz, & V. Kalogera
Astrophys. J. **757**, 91 (2012)
 52. **The Most Massive Objects in the Universe**
D.E. Holz & S. Perlmutter
Astrophys. J. Lett. **755**, 36 (2012)

...publications continued next page...

PUBLICATIONS (click on titles to link to articles)

-
53. **Finding the First Cosmic Explosions I: Pair-Instability Supernovae**
D.J. Whalen et al.
Astrophys. J. **777**, 110 (2013)
 54. **Finding the First Cosmic Explosions II: Core-Collapse Supernovae**
D.J. Whalen et al.
Astrophys. J. **768**, 95 (2013)
 55. **Double Compact Objects II: Cosmological Merger Rates**
M. Dominik, K. Belczynski, C. Fryer, D.E. Holz, E. Berti, et al.
Astrophys. J. **779**, 72 (2013)
 56. **Seeing the First Supernovae at the Edge of the Universe with JWST**
D.J. Whalen, C.L. Fryer, D.E. Holz, et al.
Astrophys. J. Lett. **762**, L6 (2013)
 57. **Illuminating the Primeval Universe with Type II_n Supernovae**
D.J. Whalen et al.
Astrophys. J. **768**, 195 (2013)
 58. **Supermassive Seeds for Supermassive Black Holes**
J.L. Johnson, D.J. Whalen, H. Li, & D.E. Holz
Astrophys. J. **771**, 116 (2013)
 59. **Detecting Ancient Supernovae at $z \sim 5-12$ with CLASH**
D.J. Whalen, J. Smidt, J.L. Johnson, D.E. Holz, M. Stiavelli, & C.L. Fryer
arXiv:1312.6330 (2013)
 60. **Gamma-ray Burst Beaming and Gravitational-Wave Observations**
H.-Y. Chen & D.E. Holz
Phys. Rev. Lett. **111**, 181101 (2013)
 61. **Determining the Hubble Constant from Gravitational Wave Observations of Merging Compact Binaries**
S. Nissanke, D.E. Holz, N. Dalal, S.A. Hughes, J.L. Sievers, & C.M. Hirata
arXiv:1307.2638 (2013)
 62. **The Formation and Gravitational-Wave Detection of Massive Stellar Black Hole Binaries**
K. Belczynski, A. Buonanno, M. Cantiello, C.L. Fryer, D.E. Holz, I. Mandel,
M.C. Miller, & M. Walczak
Astrophys. J. **789**, 120 (2014)
 63. **Dark Sky Simulations: Early Data Release**
S.W. Skillman, M.S. Warren, M.J. Turk, R.H. Wechsler, D.E. Holz, & P.M. Sutter
arXiv:1407.2600 (2014)
 64. **Double Compact Objects III: Gravitational Wave Detection Rates**
M. Dominik, E. Berti, R. O'Shaughnessy, I. Mandel, K. Belczynski, C.L. Fryer,
D.E. Holz, T. Bulik, & F. Pannarale
Astrophys. J. **806**, 263 (2015)
 65. **The Loudest Gravitational Wave Events**
H.-Y. Chen & D.E. Holz
arXiv:1409.0522 (2015)

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PUBLICATIONS (click on titles to link to articles)

-
66. **Neutron Stars versus Black Holes: Probing the Mass Gap with LIGO/Virgo**
T.B. Littenberg, B. Farr, S. Coughlin, V. Kalogera, & D.E. Holz
Astrophys. J. Lett. **807** 24 (2015)
 67. **Cosmic variance in the nanohertz gravitational wave background**
E. Roebber, G. Holder, D.E. Holz, & M. Warren
Astrophys. J. **819** 163 (2016)
 68. **Compact Binary Merger Rates: Comparison with LIGO/Virgo Upper Limits**
K. Belczynski, S. Repetto, D.E. Holz, et al.
Astrophys. J. **819** 108 (2016)
 69. **Observation of Gravitational Waves from a Binary Black Hole Merger**
B.P. Abbott et al.
Phys. Rev. Lett. **116** 011102 (2016)
 70. **Astrophysical Implications of the Binary Black-hole Merger GW150914**
B.P. Abbott et al.
Astrophys. J. Lett. **818** 22 (2016)
 71. **GW150914: First results from the search for binary black hole coalescence with Advanced LIGO**
B.P. Abbott et al.
Phys. Rev. D **93** 122003 (2016)
 72. **Tests of General Relativity with GW150914**
B.P. Abbott et al.
Phys. Rev. Lett. **116** 1101 (2016)
 73. **Properties of the Binary Black Hole Merger GW150914**
B.P. Abbott et al.
Phys. Rev. Lett. **116** 241102 (2016)
 74. **The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914**
B.P. Abbott et al.
Astrophys. J. Lett. **833** 1 (2016)
 75. **A Dark Energy Camera Search for an Optical Counterpart to the First Advanced LIGO Gravitational Wave Event GW150914**
M. Soares-Santos et al.
Astrophys. J. Lett. **823** 33 (2016)
 76. **A Dark Energy Camera Search for Missing Supergiants in the LMC After the Advanced LIGO Gravitational Wave Event GW150914**
J. Annis et al.
Astrophys. J. Lett. **823** 34 (2016)
 77. **Going the Distance: Mapping Host Galaxies of LIGO and Virgo Sources in Three Dimensions Using Local Cosmography and Targeted Follow-up**
L.P. Singer, H.-Y. Chen, D.E. Holz, et al.
Astrophys. J. Lett. **829** 15 (2016); [AAS Nova selection](#)
 78. **Localization and Broadband Follow-up of the Gravitational-wave Transient GW150914**
B.P. Abbott et al.
Astrophys. J. Lett. **826** 13 (2016)

...publications continued next page...

PUBLICATIONS (click on titles to link to articles)

79. **The origin and evolution of LIGO's first gravitational-wave source**
K. Belczynski, D.E. Holz, T. Bulik, & R. O'Shaughnessy
Nature **534** 512 (2016)
80. **GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence**
B.P. Abbott et al.
Phys. Rev. Lett. **116** 241103 (2016)
81. **A DECAM Search for an Optical Counterpart to the LIGO Gravitational-wave Event GW151226**
P.S. Cowperthwaite et al.
Astrophys. J. Lett **826** 29 (2016)
82. **The Effect of Pair-Instability Mass Loss on Black Hole Mergers**
K. Belczynski et al.
Astron. Astrophys. **594** 97 (2016)
83. **Upper limits on the rates of binary neutron star and neutron-star–black-hole mergers from Advanced LIGO's first observing run**
B.P. Abbott et al.
Astrophys. J. Lett. **832** 21 (2016)
84. **The basic physics of the binary black hole merger GW150914**
B.P. Abbott et al.
Annalen der Physik **529** 1600209 (2017)
85. **Facilitating follow-up of LIGO-Virgo events using rapid sky localization**
H.-Y. Chen & D.E. Holz
Astrophys. J. **840** 88 (2017)
86. **Observational Selection Effects with Ground-based Gravitational Wave Detectors**
H.-Y. Chen, R. Essick, S. Vitale, & D.E. Holz
Astrophys. J. **835** 31 (2017)
87. **A Search for Kilonovae in the Dark Energy Survey**
Z. Doctor, R. Kessler, H. Y. Chen, B. Farr, D. A. Finley, R. J. Foley,
D. A. Goldstein, D. E. Holz, et al.
Astrophys. J. **837** 1 (2017)
88. **Are LIGO's Black Holes Made From Smaller Black Holes?**
M. Fishbach, D.E. Holz, & B. Farr
Astrophys. J. Lett. **840** L24 (2017); [AAS Nova selection](#)
89. **GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence**
B. P. Abbott et al.
Phys. Rev. Lett. **119**, 141101 (2017)
90. **Finding the One: Identifying the Host Galaxies of Gravitational-Wave Sources**
H.-Y. Chen & D.E. Holz
arXiv:1612.01471 (2017)

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PUBLICATIONS (click on titles to link to articles)

-
91. **GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral**
B. P. Abbott et al.
Phys. Rev. Lett. **119**, 161101 (2017)
 92. **Multi-messenger Observations of a Binary Neutron Star Merger**
B. P. Abbott et al.
Astrophys. J. Lett. **848**, L12 (2017)
 93. **Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A**
B. P. Abbott et al.
Astrophys. J. Lett. **848**, L13 (2017)
 94. **A gravitational-wave standard siren measurement of the Hubble constant**
B. P. Abbott et al.
Nature **551**, 85 (2017)
 95. **The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. I. Discovery of the Optical Counterpart Using the Dark Energy Camera**
M. Soares-Santos, D. E. Holz et al.
Astrophys. J. Lett. **848**, L16 (2017)
 96. **The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. II. UV, Optical, and Near-infrared Light Curves and Comparison to Kilonova Models**
P. S. Cowperthwaite et al.
Astrophys. J. Lett. **848**, L17 (2017)
 97. **The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. III. Optical and UV Spectra of a Blue Kilonova from Fast Polar Ejecta**
M. Nicholl et al.
Astrophys. J. Lett. **848**, L18 (2017)
 98. **The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. IV. Detection of Near-infrared Signatures of r-process Nucleosynthesis with Gemini-South**
R. Chornock et al.
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P. K. Blanchard et al.
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W. Fong et al.
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103. **Where are LIGO's Big Black Holes?**
M. Fishbach & D.E. Holz
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 104. **Statistical Gravitational Waveform Models: What to Simulate Next?**
Z. Doctor, B. Farr, D.E. Holz, & M. Pürrer
Phys. Rev. **D96**, 123011 (2017)
 105. **GW170608: Observation of a 19 Solar-mass Binary Black Hole Coalescence**
B. P. Abbott et al.
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 106. **Using spin to understand the formation of LIGO's black holes**
B. Farr, D.E. Holz, & W. M. Farr
Astrophys. J. Lett. **854**, L9 (2018)
 107. **How Many Kilonovae Can Be Found in Past, Present, and Future Survey Data Sets?**
D. Scolnic et al.
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M. Kesden, & D.E. Holz
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 112. **Impact of inter-correlated initial binary parameters on double black hole/neutron star mergers**
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 114. **Limits on the number of spacetime dimensions from GW170817**
K. Pardo, M. Fishbach, D.E. Holz, & D.N. Spergel
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 115. **Does the Black Hole Merger Rate Evolve with Redshift?**
M. Fishbach, D.E. Holz, & W.M. Farr
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 117. **A standard siren measurement of the Hubble constant from GW170817 without the electromagnetic counterpart**
M. Fishbach et al.
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 118. **Standard sirens with a running Planck mass**
M. Lagos, M. Fishbach, P. Landry, & D.E. Holz
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M. Soares-Santos et al.
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 121. **Black hole shadows, photon rings, and lensing rings**
S. Gralla, D.E. Holz, & R.M. Wald
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 122. **A Future Percent-level Measurement of the Hubble Expansion at Redshift 0.8 with Advanced LIGO**
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 123. **Properties of the binary neutron star merger GW170817**
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B.P. Abbott et al.
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129. **Picky Partners: The Pairing of Component Masses in Binary Black Hole Mergers**
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M. Fishbach, W.M. Farr, & D.E. Holz
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131. **Nonparametric inference of neutron star composition, equation of state, and maximum mass with GW170817**
R. Essick, P. Landry, & D.E. Holz
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132. **Evolutionary roads leading to low effective spins, high black hole masses, and O1/O2 rates for LIGO/Virgo binary black holes**
K. Belczynski et al.
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133. **Black Hole Coagulation: Modeling Hierarchical Mergers in Black Hole Populations**
Z. Doctor, D. Wysocki, R. O’Shaughnessy, D.E. Holz, & B. Farr
Astroph. J. **893**, 35 (2020)
134. **Counting on Short Gamma-Ray Bursts: Gravitational-wave Constraints of Jet Geometry**
A. Farah, R. Essick, Z. Doctor, M. Fishbach & D.E. Holz
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135. **Shouts and Murmurs: Combining Individual Gravitational-wave Sources with the Stochastic Background to Measure the History of Binary Black Hole Mergers**
T. Calliser, M. Fishbach, D.E. Holz, & W.M. Farr
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136. **Does Matter Matter? Using the Mass Distribution to Distinguish Neutron Stars and Black Holes**
M. Fishbach, R. Essick, & D.E. Holz
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A. Olejak, M. Fishbach, K. Belczynski, D.E. Holz, J.-P. Lasota, M.C. Miller, & T. Bulik
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138. **A Statistical Standard Siren Measurement of the Hubble Constant from the LIGO/Virgo Gravitational Wave Compact Object Merger GW190814 and Dark Energy Survey Galaxies**
A. Palmese et al.
Astroph. J. Lett. **900**, L33 (2020)
139. **Direct astrophysical tests of chiral effective field theory at supranuclear densities**
R. Essick, I. Tews, P. Landry, S. Reddy, & D.E. Holz
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140. **Minding the Gap: GW190521 as a Straddling Binary**
M. Fishbach & D.E. Holz
Astroph. J. Lett. **904**, L26 (2020)
141. **The Binary-Host Connection: Astrophysics of Gravitational-Wave Binaries from Host Galaxy Properties**
S. Adhikari, M. Fishbach, D.E. Holz, R.H. Wechsler, & Z. Fang
Astroph. J. **905**, 21 (2020)

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142. **Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA**
B.P. Abbott et al.
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142. **GW190521: A Binary Black Hole Merger with a Total Mass of $150 M_{\odot}$**
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144. **GW190425: Observation of a Compact Binary Coalescence with Total Mass $\sim 3.4 M_{\odot}$**
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R. Abbott et al.
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147. **Jumping the Gap: Searching for LIGO's Biggest Black Holes**
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J.M. Ezquiaga, D.E. Holz, W. Hu, M. Lagos, & R.M. Wald
Phys. Rev. D **103**, 064047 (2021)
150. **One Channel to Rule Them All? Constraining the Origins of Binary Black Holes Using Multiple Formation Pathways**
M. Zevin et al.
Astroph. J. **910**, 152 (2021)
151. **When Are LIGO/Virgo's Big Black Hole Mergers?**
M. Fishbach et al.
Astroph. J. Lett. **912**, 98 (2021)
152. **The Gravity Collective: A Search for the Electromagnetic Counterpart to the Neutron Star-Black Hole Merger GW190814**
C.D. Kilpatrick et al.
arXiv:2106.06897 (2021)
153. **GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo during the First Half of the Third Observing Run**
R. Abbott et al.
Phys. Rev. X **11**, 2 (2021)

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154. **Cosmology with Love: Measuring the Hubble constant using neutron star universal relations**
D. Chatterjee et al.
Phys. Rev. D **104**, 083528 (2021); [Editors' Suggestion](#)
 155. **Black Hole Leftovers: The Remnant Population from Binary Black Hole Mergers**
Z. Doctor, B. Farr, & D.E. Holz
Astroph. J. Lett. **914**, L18 (2021)
 156. **Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog**
R. Abbott et al.
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 157. **A Gravitational-wave Measurement of the Hubble Constant Following the Second Observing Run of Advanced LIGO and Virgo**
B.P. Abbott et al.
Astroph. J. **909**, 218 (2021)
 158. **Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run**
R. Abbott
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 159. **Observation of Gravitational Waves from Two Neutron Star-Black Hole Coalescences**
R. Abbott et al.
Astroph. J. Lett. **915**, L5 (2021)
 160. **GWTC-2.1: Deep Extended Catalog of Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run**
R. Abbott et al.
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R. Abbott et al.
arXiv:2111.03606 (2021)
 162. **Tests of general relativity with binary black holes from the second LIGO-Virgo gravitational-wave transient catalog**
R. Abbott et al.
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 163. **Constraints on the cosmic expansion history from GWTC-3**
R. Abbott et al.
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 164. **Population of merging compact binaries inferred using GWs through GWTC-3**
R. Abbott et al.
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 165. **Please repeat: Strong lensing of gravitational waves as a probe of compact binary and galaxy populations**
F. Xu, J.M. Ezquiaga, & D.E. Holz
Astrophys. J. **929**, 9 (2022)

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166. **Don't Leave One Out: Probing Extremal Gravitational-Wave Events with Coarse-Grained Likelihoods**
R. Essick et al.
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167. **Bridging the Gap: Categorizing Gravitational-Wave Events at the Transition Between Neutron Stars and Black Holes**
A.M. Farah, M. Fishbach, R. Essick, D.E. Holz, & S. Galaudage
Astrophys. J. **931**, 108 (2022)
169. **Avoiding a Cluster Catastrophe: Retention Efficiency and the Binary Black Hole Mass Spectrum**
M. Zevin & D.E. Holz
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170. **Observational Inference on the Delay Time Distribution of Short Gamma-ray Bursts**
M. Zevin, A.E. Nugent, S. Adhikari, W. Fong, D.E. Holz, & L.Z. Kelley
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171. **Spectral sirens: cosmology from the full mass distribution of compact binaries**
J.M. Ezquiaga & D.E. Holz
Phys. Rev. Lett. **129**, 061102 (2022)
168. **Lensing or luck? False alarm probabilities for gravitational lensing of gravitational waves**
M. Çalişkan, J.M. Ezquiaga, O. A. Hannuksela, & D.E. Holz
Phys. Rev. D **107** 063023 (2023)
172. **Breaking Bad Degeneracies with Love: Improving gravitational-wave measurements through universal relations**
Y. Xie, D. Chatterjee, G. Holder, D.E. Holz, S. Perkins, K. Yagi, & N. Yunes
Phys. Rev. D **107** 043010 (2023)
173. **(An)isotropy measurement with gravitational wave observations**
R. Essick, W.M. Farr, M. Fishbach, D.E. Holz, & E. Katsavounidis
Phys. Rev. D **107** 043016 (2023)
174. **Things That Might Go Bump in the Night: Assessing Structure in the Binary Black Hole Mass Spectrum**
A. Farah, B. Edelman, M. Zevin, M. Fishbach, J.M. Ezquiaga, B. Farr, & D.E. Holz
Phys. Rev. D **107** 043010 (2023)
175. **Two of a Kind: Comparing big and small black holes in binaries with gravitational waves**
A. Farah, M. Fishbach, & D.E. Holz
arXiv:2308.05102 (2023)

NOTE:

Only LIGO papers to which I have made significant contributions are included above.
Click [here](#) for a complete list of all of my publications.
Click [here](#) for all of my papers, *excluding* all LIGO collaboration papers.

PROCEEDINGS/MISCELLANEOUS

Coalescence of primal gravity waves to make cosmological mass without matter

D.E. Holz, W.A. Miller, M. Wakano, & J.A. Wheeler
 in *Directions in General Relativity, Volume 2*
 eds. B.L. Hu & T.A. Jacobson (Cambridge University Press: 1993)

Physics in knots

D.E. Holz, A. Kheyfets, W.A. Miller, & J.A. Wheeler
 in *Physical Origins of Time Asymmetry*
 eds. J.J. Halliwell, J. Pérez-Mercader, & W.H. Zurek (Cambridge University Press: 1994)

Shedding light on dark matter

D.E. Holz
Nature **400**, 819 (1999)

SNAP and multiply-imaged supernovae

D.E. Holz
 invited contribution, *SNAP yellow book* (2001)

Gravitational waves from core-collapse

C.L. Fryer, M.S. Warren, D.E. Holz, S.A. Hughes, & R. Dupuis
 in *Gravitational-Wave Detection*
 SPIE, vol. 4856, eds. P. Saulson & M. Cruise (2002)

Stellar collapse and gravitational waves

C.L. Fryer, D.E. Holz, S.A. Hughes, & M.S. Warren
 in *Stellar Collapse* (Astrophysics and Space Sciences)
 ed. C.L. Fryer (Kluwer: 2004)

An accelerated history of the Universe

D.E. Holz
 in *Seventh International Conference on Particles and Nuclei*
 AIP conference proceedings, **842**, 741 (2006)

Dark Cosmos: In Search of Our Universe's Missing Mass and Energy

D.E. Holz
 Book review in *Physics Today*, **60**, 62 (2007)

Running after $w(z)$: Some stumbling blocks

D. Sarkar et al.
Nuc. Phys. B **194**, 307 (2009)

Astro2010 Decadal Survey Whitepaper: Coordinated Science in the Gravitational and Electromagnetic Skies

S. Bloom, D.E. Holz, S.A. Hughes, K. Menou et al. (2010)

Astro2010 Decadal Survey Whitepaper: Precision Cosmology with Gravitational Waves

C.J. Hogan, B.F. Schutz, C.J. Cutler, S.A. Hughes, & D.E. Holz (2010)

The Gravitational Universe

The eLISA Consortium; arXiv:1305.5720 (2013)

Distance Probes of Dark Energy (Snowmass report)

A. Kim, N. Padmanabhan et al. *Astropart. Phys.* (2014); arXiv:1309.5382

Conveying gravity: Communicating the Discovery of Gravitational Waves

J.S. Key, M. Hendry, & D.E. Holz; APS News "The Back Page" (August/September 2016)

Measuring cosmic distances with standard sirens

D.E. Holz, S.A. Hughes, & B.F. Schutz *Physics Today* **71**, 34 (2018)

INVITED TALKS (very abbreviated list)

Cosmology from gravitational-wave standard sirens

ITC Colloquium, Harvard
Cambridge, MA; April, 2011

Cosmology with gravitational-waves

Physics Colloquium, Stanford
Palo Alto, CA; December, 2011

Measuring the Hubble constant with gravitational waves

Plenary talk, Gravitational Physics & Astrophysics conference (GWPAW)
Hannover, Germany; June, 2012

Gravitational waves

Course lecturer, Cosmology on the Beach
Los Cabos, Mexico; January, 2014

Gravitational wave astrophysics with LIGO

ITC Colloquium, Harvard University
Cambridge, MA; September, 2014

Astrophysical sources of gravitational waves and electromagnetic counterparts

Invited talk in special session “The Quest for Gravitational Waves, 100 years After Einstein”
American Astronomical Society meeting; Seattle, WA; January, 2015

Astrophysical implications of GW150914

presentation of GW150914 companion paper on behalf of the LVC
APS April meeting; Salt Lake City, UT; April, 2016

Observation of Gravitational Waves from a Binary Black Hole Merger

Physics Colloquia at FNAL, LBL/Berkeley, Madison, Stanford, UCLA
Winter/Spring 2016

How does the Universe make LIGO’s black holes?

KITP Blackboard Talk; Santa Barbara, CA; August 2016

Gravitational waves, black holes, and LIGO

National Academy of Sciences/Kavli Frontiers of Science; Irvine, CA; February 2017

Hearing and Seeing GW170817

IAS/Princeton joint colloquium; Princeton, NJ; December 2017

GW170817: Hearing and Seeing a Binary Neutron Star Merger

UPenn Rittenhouse Lecture; Philadelphia, PA; December 2017

Some recent results in gravitational-wave astrophysics

Harvard Sackler Conference: Gravitational Wave Astrophysics; Boston, MA; May 2018

Hearing and Seeing a Binary Neutron Star Merger

Stanford Physics Colloquium; Stanford, CA; May 2018

Cosmology with standard sirens and the Hubble tension

The New Era of Gravitational-Wave Physics and Astrophysics; Santa Barbara, CA; June 2019

Gravitational waves: binaries

SLAC Summer Institute: The almost invisibles; Stanford (Virtual); April 2020

Gravitational wave sources, detection, and interpretation

Dirac Lectures: Gravitational Waves; Florida State University (Virtual); October 2020

Gravitational-wave science update

COSMO-21 plenary; UIUC (Virtual); August 2021

Some recent results in gravitational-wave science

Harvard ITC Colloquium; Boston, MA; September 2022

Update on GW standard siren cosmology

Keynote at Tensions in Cosmology (Corfu Summer Institute); Greece (Virtual); September 2022

Intro: the pieces of the population problem

Gravitational-wave populations: What’s next?; Milan, Italy; July 2023