

# David A. Nichols, Ph.D.

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## Address:

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## Education

- Ph.D., Physics** *California Institute of Technology (Caltech)* 06/2012  
– Ph.D. thesis supervisor: Prof. Yanbei Chen
- M.S., Physics** *California Institute of Technology (Caltech)* 06/2008
- B.A., Math and Physics** *Claremont McKenna College* 05/2006  
– Valedictorian, *summa cum laude*, honors in both degrees

## Academic Positions

- Assistant Professor of Physics** *University of Virginia* 08/2019–present
- Senior Postdoctoral Researcher** *University of Amsterdam* 07/2018–07/2019  
– Postdoctoral supervisor: Prof. Samaya Nissanke
- Postdoctoral Researcher** *Radboud University* 09/2016–06/2018  
– Postdoctoral supervisor: Prof. Samaya Nissanke
- Postdoctoral Associate** *Cornell University* 09/2012–08/2016  
– Postdoctoral supervisor: Prof. Éanna É. Flanagan
- Postdoctoral Researcher** *Caltech* 06/2012–08/2012  
– Postdoctoral supervisor: Prof. Yanbei Chen

## Courses Taught and Guest Lectures

### Courses Taught

- Advanced General Relativity** *University of Virginia* Fall 2019
- Computational Physics** (co-taught) *Cornell University* Spring 2015
- Quantum Mechanics** *Claremont McKenna College* Spring 2011

### Guest Lectures

- Astroparticle Physics** *Amsterdam University College* 05/2019
- General Relativity** *University of Amsterdam* 04/2017

## Selected Awards, Honors, and Fellowships

- David and Barbara Groce Graduate Fellowship, 2009–2010
- Rose Hills Foundation Graduate Fellowship, 2006–2007
- Barry M. Goldwater Scholarship, 2004–2006
- GGR Travel Grant, 2009, 2010, 2012
- Phi Beta Kappa, 2005

## Research Interests

Compact binaries, gravitational waves, gravitational-wave memory, asymptotic spacetime symmetries, electromagnetic follow-up of gravitational-wave sources, gravitational-wave tests of general relativity, black-hole perturbation theory, post-Newtonian theory, numerical relativity, black-hole physics.

## Professional Activities

### Advising

Arwa Elhashash (Ph.D. student)	<i>University of Virginia</i>	07/2019–present
Oliver Boersma (M.S. student; co-advised)	<i>Radboud University</i>	01/2018–present
Andris Dorozsmai (M.S. student; co-advised)	<i>Radboud University</i>	01/2017–07/2018

### Collaboration Memberships

<b>LISA Consortium</b> , <i>University of Amsterdam group</i> ,	01/2019–09/2019
<b>Virgo Collaboration</b> , <i>Radboud and Nikhef groups</i> ,	09/2016–09/2019
<b>GROWTH Collaboration</b> , <i>University of Amsterdam group</i> ,	09/2017–09/2018
<b>LIGO Scientific Collaboration</b> , <i>Caltech Relativity Theory</i> ,	09/2015–09/2016

### Conference and Seminar Organization

<b>GRAPPA Colloquium Series</b> , Organizing committee,	09/2018–07/2019
<b>UvA GW seminars</b> , Organizing committee,	09/2018–07/2019
<b>72<sup>nd</sup> Netherlands Astronomy Conference</b> , Organizing committees,	05/2019

### Peer Reviewing

**Journals:** Physical Review Letters, Physical Review D, The Astrophysical Journal, Proceedings of the Royal Society A, Journal of Cosmology and Astroparticle Physics, International Journal of Modern Physics D, European Physical Journal C

**Funding Agencies:** Science and Technologies Facilities Council (STFC), Comisión Nacional de Investigación Científico y Tecnológico (CONICYT)

## Publications

### Short-Author-List Pre-prints

1. T. Hinderer, S. Nissanke, F. Foucart, K. Hotokezaka, T. Vincent, M. Kasliwal, P. Schmidt, A. R. Williamson, **D. A. Nichols**, M. Duez, L. E. Kidder, H. P. Pfeiffer, and M. A. Scheel, “Discerning the binary neutron star or neutron star-black hole nature of GW170817 with Gravitational Wave and Electromagnetic Measurements,” (2018), [arXiv:1808.03836](https://arxiv.org/abs/1808.03836) [astro-ph.HE]

**Short-Author-List, Peer-Reviewed Articles**

21. É. É. Flanagan, A. M. Grant, A. I. Harte, and **D. A. Nichols**, “Persistent gravitational wave observables: general framework,” *Phys. Rev. D* **99**, 084044 (2019), [arXiv:1901.00021 \[gr-qc\]](#)
20. **D. A. Nichols**, “Center-of-mass angular momentum and memory effect in asymptotically flat spacetimes,” *Phys. Rev. D* **98**, 064032 (2018), [arXiv:1807.08767 \[gr-qc\]](#)
19. **D. A. Nichols**, “Spin memory effect for compact binaries in the post-Newtonian approximation,” *Phys. Rev. D* **95**, 084048 (2017), [arXiv:1702.03300 \[gr-qc\]](#)
18. A. Ghosh, A. Ghosh, N. Johnson-McDaniel, C. K. Mitra, P. Ajith, W. Del Pozzo, **D. A. Nichols**, Y. Chen, A. B. Nielsen, C. P. L. Berry, and L. London, “Testing general relativity using golden black-hole binaries,” *Phys. Rev. D* **94**, 021101 (2016), [arXiv:1602.02453 \[gr-qc\]](#)
17. É. É. Flanagan, **D. A. Nichols**, L. C. Stein, and J. Vines, “Prescriptions for measuring and transporting local angular momenta in general relativity,” *Phys. Rev. D* **93**, 104007 (2016), [arXiv:1602.01847 \[gr-qc\]](#)
16. É. É. Flanagan and **D. A. Nichols**, “Conserved charges of the extended Bondi-Metzner-Sachs algebra,” *Phys. Rev. D* **95**, 044002 (2017), [arXiv:1510.03386 \[hep-th\]](#)
15. J. Vines and **D. A. Nichols**, “Properties of an affine transport equation and its holonomy,” *Gen. Rel. Grav.* **48**, 127 (2016), [arXiv:1412.4077 \[gr-qc\]](#)
14. É. É. Flanagan and **D. A. Nichols**, “Observer dependence of angular momentum in general relativity and its relationship to the gravitational-wave memory effect,” *Phys. Rev. D* **92**, 084057 (2015), [arXiv:1411.4599 \[gr-qc\]](#)
13. R. H. Price, J. W. Belcher, and **D. A. Nichols**, “Comparison of electromagnetic and gravitational radiation: What we can learn about each from the other,” *Am. J. Phys.* **81**, 575 (2013), [arXiv:1212.4730 \[gr-qc\]](#)
12. H. Yang, F. Zhang, A. Zimmerman, **D. A. Nichols**, E. Berti, and Y. Chen, “Branching of quasinormal modes for nearly extremal Kerr black holes,” *Phys. Rev. D* **87**, 041502 (2013), [arXiv:1212.3271 \[gr-qc\]](#)
11. **D. A. Nichols**, A. Zimmerman, Y. Chen, G. Lovelace, K. D. Matthews, R. Owen, F. Zhang, and K. S. Thorne, “Visualizing Spacetime Curvature via Frame-Drag Vortexes and Tidal Tendexes III. Quasinormal Pulsations of Schwarzschild and Kerr Black Holes,” *Phys. Rev. D* **86**, 104028 (2012), [arXiv:1208.3038 \[gr-qc\]](#)
10. F. Zhang, A. Zimmerman, **D. A. Nichols**, Y. Chen, G. Lovelace, K. D. Matthews, R. Owen, and K. S. Thorne, “Visualizing Spacetime Curvature via Frame-Drag Vortexes and Tidal Tendexes II. Stationary Black Holes,” *Phys. Rev. D* **86**, 084049 (2012), [arXiv:1208.3034 \[gr-qc\]](#)
9. H. Yang, **D. A. Nichols**, F. Zhang, A. Zimmerman, Z. Zhang, and Y. Chen, “Quasinormal-mode spectrum of Kerr black holes and its geometric interpretation,” *Phys. Rev. D* **86**, 104006 (2012), [arXiv:1207.4253 \[gr-qc\]](#)
8. **D. A. Nichols** and Y. Chen, “Hybrid method for understanding black-hole mergers: Inspiralling case,” *Phys. Rev. D* **85**, 044035 (2012), [arXiv:1109.0081 \[gr-qc\]](#)
7. **D. A. Nichols**, R. Owen, F. Zhang, A. Zimmermann, J. Brink, Y. Chen, G. Lovelace, K. D. Matthews, M. A. Scheel, and K. S. Thorne, “Visualizing Spacetime Curvature via Frame-Drag Vortexes and Tidal Tendexes I. General Theory and Weak-Gravity Applications,” *Phys. Rev. D* **84**, 124014 (2011), [arXiv:1108.5486 \[gr-qc\]](#)
6. A. Zimmerman, **D. A. Nichols**, and F. Zhang, “Classifying the Isolated Zeros of Asymptotic Gravitational Radiation by Tendex and Vortex Lines,” *Phys. Rev. D* **84**, 044037 (2011), [arXiv:1107.2959 \[gr-qc\]](#)
5. R. Owen, J. Brink, Y. Chen, J. D. Kaplan, G. Lovelace, K. D. Matthews, **D. A. Nichols**,

- M. A. Scheel, F. Zhang, A. Zimmerman, and K. S. Thorne, “Frame-Dragging Vortexes and Tidal Tendexes Attached to Colliding Black Holes: Visualizing the Curvature of Spacetime,” *Phys. Rev. Lett.* **106**, 151101 (2011), [arXiv:1012.4869 \[gr-qc\]](#)
4. **D. A. Nichols** and Y. Chen, “A hybrid method for understanding black-hole mergers: head-on case,” *Phys. Rev. D* **82**, 104020 (2010), [arXiv:1007.2024 \[gr-qc\]](#)
  3. G. Lovelace, Y. Chen, M. Cohen, J. D. Kaplan, D. Keppel, K. D. Matthews, **D. A. Nichols**, M. A. Scheel, and U. Sperhake, “Momentum flow in black-hole binaries. II. Numerical simulations of equal-mass, head-on mergers with antiparallel spins,” *Phys. Rev. D* **82**, 064031 (2010), [arXiv:0907.0869 \[gr-qc\]](#)
  2. D. Keppel, **D. A. Nichols**, Y. Chen, and K. S. Thorne, “Momentum Flow in Black Hole Binaries. I. Post-Newtonian Analysis of the Inspiral and Spin-Induced Bobbing,” *Phys. Rev. D* **80**, 124015 (2009), [arXiv:0902.4077 \[gr-qc\]](#)
  1. J. D. Kaplan, **D. A. Nichols**, and K. S. Thorne, “Post-Newtonian Approximation in Maxwell-Like Form,” *Phys. Rev. D* **80**, 124014 (2009), [arXiv:0808.2510 \[gr-qc\]](#)

### Papers and Pre-prints as Part of Scientific Collaborations

52. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model,” (2019), [arXiv:1906.12040 \[gr-qc\]](#)
51. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network,” (2019), [arXiv:1906.08000 \[gr-qc\]](#)
50. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “All-sky search for short gravitational-wave bursts in the second Advanced LIGO and Advanced Virgo run,” *Phys. Rev. D* **100**, 024017 (2019), [arXiv:1905.03457 \[gr-qc\]](#)
49. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for sub-solar mass ultracompact binaries in Advanced LIGO’s second observing run,” (2019), [arXiv:1904.08976 \[astro-ph.CO\]](#)
48. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “All-sky search for long-duration gravitational-wave transients in the second Advanced LIGO observing run,” *Phys. Rev. D* **99**, 104033 (2019), [arXiv:1903.12015 \[gr-qc\]](#)
47. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Directional limits on persistent gravitational waves using data from Advanced LIGO’s first two observing runs,” (2019), [arXiv:1903.08844 \[gr-qc\]](#)
46. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Tests of General Relativity with the Binary Black Hole Signals from the LIGO-Virgo Catalog GWTC-1,” (2019), [arXiv:1903.04467 \[gr-qc\]](#)
45. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “A search for the isotropic stochastic background using data from Advanced LIGO’s second observing run,” (2019), [arXiv:1903.02886 \[gr-qc\]](#)
44. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data,” *Phys. Rev. D* **100**, 024004 (2019), [arXiv:1903.01901 \[astro-ph.HE\]](#)
43. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Searches for Gravitational Waves from Known Pulsars at Two Harmonics in 2015-2017 LIGO Data,” *Astrophys. J.* **879**, 10 (2019), [arXiv:1902.08507 \[astro-ph.HE\]](#)
42. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run,” *Phys. Rev. D* **99**, 122002 (2019), [arXiv:1902.08442 \[gr-qc\]](#)
41. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for Transient Gravitational-wave Sig-

- nals Associated with Magnetar Bursts during Advanced LIGO's Second Observing Run," *Astrophys. J.* **874**, 163 (2019), [arXiv:1902.01557 \[astro-ph.HE\]](#)
40. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Low-latency Gravitational-wave Alerts for Multimessenger Astronomy during the Second Advanced LIGO and Virgo Observing Run," *Astrophys. J.* **875**, 161 (2019), [arXiv:1901.03310 \[astro-ph.HE\]](#)
  39. M. Soares-Santos *et al.* (DES, LIGO Scientific, Virgo), "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," *Astrophys. J.* **876**, L7 (2019), [arXiv:1901.01540 \[astro-ph.CO\]](#)
  38. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Searches for Continuous Gravitational Waves from 15 Supernova Remnants and Fomalhaut b with Advanced LIGO," *Astrophys. J.* **875**, 122 (2019), [arXiv:1812.11656 \[astro-ph.HE\]](#)
  37. F. Acernese *et al.* (Virgo), "Status of Advanced Virgo," *Proceedings, 6th International Conference on New Frontiers in Physics (ICNFP 2017): Crete, Greece, August 17-29, 2017*, *EPJ Web Conf.* **182**, 02003 (2018)
  36. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs," (2018), [arXiv:1811.12907 \[astro-ph.HE\]](#)
  35. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo," (2018), [arXiv:1811.12940 \[astro-ph.HE\]](#)
  34. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Tests of General Relativity with GW170817," *Phys. Rev. Lett.* **123**, 011102 (2019), [arXiv:1811.00364 \[gr-qc\]](#)
  33. A. Albert *et al.* (ANTARES, IceCube, LIGO Scientific, Virgo), "Search for Multi-messenger Sources of Gravitational Waves and High-energy Neutrinos with Advanced LIGO during its first Observing Run, ANTARES and IceCube," *Astrophys. J.* **870**, 134 (2019), [arXiv:1810.10693 \[astro-ph.HE\]](#)
  32. E. Burns *et al.* (Fermi Gamma-ray Burst Monitor Team, LIGO Scientific, Virgo), "A Fermi Gamma-ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-Wave Candidates in Advanced LIGO's First Observing Run," *Astrophys. J.* **871**, 90 (2019), [arXiv:1810.02764 \[astro-ph.HE\]](#)
  31. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817," *Astrophys. J.* **875**, 160 (2019), [arXiv:1810.02581 \[gr-qc\]](#)
  30. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Constraining the p-mode-g-mode tidal instability with GW170817," *Phys. Rev. Lett.* **122**, 061104 (2019), [arXiv:1808.08676 \[astro-ph.HE\]](#)
  29. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Search for sub-solar mass ultracompact binaries in Advanced LIGO's first observing run," *Phys. Rev. Lett.* **121**, 231103 (2018), [arXiv:1808.04771 \[astro-ph.CO\]](#)
  28. F. Acernese *et al.* (Virgo), "Calibration of Advanced Virgo and Reconstruction of the Gravitational Wave Signal  $h(t)$  during the Science Run O2," *Classical Quantum Gravity* **35**, 205004 (2018), [arXiv:1807.03275 \[gr-qc\]](#)
  27. L. Barack *et al.* (GWverse), "Black holes, gravitational waves and fundamental physics: a roadmap," *Classical Quantum Gravity* **36**, 143001 (2019), [arXiv:1806.05195 \[gr-qc\]](#)
  26. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "Properties of the binary neutron star merger GW170817," *Phys. Rev. X* **9**, 011001 (2019), [arXiv:1805.11579 \[gr-qc\]](#)
  25. B. P. Abbott *et al.* (LIGO Scientific, Virgo), "GW170817: Measurements of neutron star radii and equation of state," *Phys. Rev. Lett.* **121**, 161101 (2018), [arXiv:1805.11581 \[gr-qc\]](#)

24. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “A Search for Tensor, Vector, and Scalar Polarizations in the Stochastic Gravitational-Wave Background,” *Phys. Rev. Lett.* **120**, 201102 (2018), [arXiv:1802.10194 \[gr-qc\]](#)
23. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Full Band All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data,” *Phys. Rev. D* **97**, 102003 (2018), [arXiv:1802.05241 \[gr-qc\]](#)
22. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Constraints on cosmic strings using data from the first Advanced LIGO observing run,” *Phys. Rev. D* **97**, 102002 (2018), [arXiv:1712.01168 \[gr-qc\]](#)
21. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “GW170608: Observation of a 19-solar-mass Binary Black Hole Coalescence,” *Astrophys. J.* **851**, L35 (2017), [arXiv:1711.05578 \[astro-ph.HE\]](#)
20. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for post-merger gravitational waves from the remnant of the binary neutron star merger GW170817,” *Astrophys. J.* **851**, L16 (2017), [arXiv:1710.09320 \[astro-ph.HE\]](#)
19. M. M. Kasliwal *et al.* (GROWTH), “Illuminating Gravitational Waves: A Concordant Picture of Photons from a Neutron Star Merger,” *Science* **358**, 1579 (2017), [arXiv:1710.05436 \[astro-ph.HE\]](#)
18. G. Hallinan *et al.* (GROWTH), “A Radio Counterpart to a Neutron Star Merger,” *Science* **358**, 1559 (2017), [arXiv:1710.05435 \[astro-ph.HE\]](#)
17. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral,” *Phys. Rev. Lett.* **119**, 161101 (2017), [arXiv:1710.05832 \[gr-qc\]](#)
16. B. P. Abbott *et al.* (LIGO Scientific, Virgo, GROND, SALT Group, OzGrav, DFN, INTEGRAL, Insight-Hxmt, MAXI Team, Fermi-LAT, J-GEM, RATIR, ATLAS, IceCube, CAAS-TRO, LWA, ePESSTO, GRAWITA, RIMAS, SKA South Africa/MeerKAT, H.E.S.S., 1M2H Team, IKI-GW Follow-up, Fermi GBM, Pi of Sky, DWF (Deeper Wider Faster Program), Dark Energy Survey, MASTER, AstroSat Cadmium Zinc Telluride Imager Team, Swift, Pierre Auger, ASKAP, VINROUGE, JAGWAR, Chandra Team at McGill University, TTU-NRAO, GROWTH, AGILE Team, MWA, ATCA, AST3, TOROS, Pan-STARRS, NuSTAR, BOOTES, CaltechNRAO, High Time Resolution Universe Survey, Nordic Optical Telescope, Las Cumbres Observatory Group, TZAC Consortium, LOFAR, IPN, DLT40, Texas Tech University, HAWC, ANTARES, KU, Dark Energy Camera GW-EM, CALET, Euro VLBI Team, ALMA), “Multi-messenger Observations of a Binary Neutron Star Merger,” *Astrophys. J.* **848**, L12 (2017), [arXiv:1710.05833 \[astro-ph.HE\]](#)
15. B. P. Abbott *et al.* (LIGO Scientific, Virgo, Fermi-GBM, INTEGRAL), “Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A,” *Astrophys. J.* **848**, L13 (2017), [arXiv:1710.05834 \[astro-ph.HE\]](#)
14. B. P. Abbott *et al.* (LIGO Scientific, Virgo, VINROUGE, Las Cumbres Observatory, DLT40, 1M2H, MASTER, Dark Energy Camera GW-EM), “A gravitational-wave standard siren measurement of the Hubble constant,” *Nature* **551**, 85 (2017), [arXiv:1710.05835 \[astro-ph.CO\]](#)
13. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817,” *Astrophys. J.* **850**, L39 (2017), [arXiv:1710.05836 \[astro-ph.HE\]](#)
12. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences,” *Phys. Rev. Lett.* **120**, 091101 (2018), [arXiv:1710.05837 \[gr-qc\]](#)
11. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “On the Progenitor of Binary Neutron Star

- Merger GW170817,” *Astrophys. J.* **850**, L40 (2017), [arXiv:1710.05838 \[astro-ph.HE\]](#)
10. A. Albert *et al.* (ANTARES, IceCube, Pierre Auger, LIGO Scientific, Virgo), “Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory,” *Astrophys. J.* **850**, L35 (2017), [arXiv:1710.05839 \[astro-ph.HE\]](#)
  9. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data,” *Phys. Rev. D* **96**, 122006 (2017), [arXiv:1710.02327 \[gr-qc\]](#)
  8. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence,” *Phys. Rev. Lett.* **119**, 141101 (2017), [arXiv:1709.09660 \[gr-qc\]](#)
  7. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “First search for nontensorial gravitational waves from known pulsars,” *Phys. Rev. Lett.* **120**, 031104 (2018), [arXiv:1709.09203 \[gr-qc\]](#)
  6. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data,” *Phys. Rev. D* **96**, 122004 (2017), [arXiv:1707.02669 \[gr-qc\]](#)
  5. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data,” *Phys. Rev. D* **96**, 062002 (2017), [arXiv:1707.02667 \[gr-qc\]](#)
  4. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-Based Cross-Correlation Search in Advanced LIGO Data,” *Astrophys. J.* **847**, 47 (2017), [arXiv:1706.03119 \[astro-ph.HE\]](#)
  3. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2,” *Phys. Rev. Lett.* **118**, 221101 (2017), [arXiv:1706.01812 \[gr-qc\]](#)
  2. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO,” *Phys. Rev. D* **96**, 022001 (2017), [arXiv:1704.04628 \[gr-qc\]](#)
  1. B. P. Abbott *et al.* (LIGO Scientific, Virgo), “Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model,” *Phys. Rev. D* **95**, 122003 (2017), [arXiv:1704.03719 \[gr-qc\]](#)

### Short-Author-List, Non-Peer-Reviewed Articles

2. A. Zimmerman, H. Yang, F. Zhang, **D. A. Nichols**, E. Berti, and Y. Chen, “Reply to ‘On the branching of quasinormal resonances of near-extremal Kerr black holes’ by Shahar Hod,” (2015), [arXiv:1510.08159 \[gr-qc\]](#)
1. **D. A. Nichols**, “Frontiers of Neutron Star Astrophysics,” in *Matters of Gravity, The Newsletter of the Topical Group on Gravitation of the American Physical Society*, Vol. 44, edited by D. Garfinkle (2014) [arXiv:1412.8368 \[gr-qc\]](#)

### Ph.D. Thesis

1. **D. A. Nichols**, *Visualizing, approximating, and understanding black-hole binaries*, [Ph.D. thesis](#), Caltech (2012)

<b>Talks and Conference Sessions Chaired</b>
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**Invited Talks**

18. **Birmingham University Astrophysics Seminar**, *05/2019*, Birmingham, UK  
“Computing and detecting gravitational-wave memory effects from binary black holes.”
17. **University of Virginia Physics Colloquium**, *02/2019*, Charlottesville, VA, USA  
“Gravitational waves and fundamental properties of matter and spacetime.”
16. **University of Mississippi Physics Colloquium**, *02/2019*, Oxford, MS, USA  
“Gravitational waves and fundamental properties of matter and spacetime.”
15. **Southern Methodist University Physics Seminar**, *02/2019*, Dallas, TX, USA  
“Gravitational waves and fundamental properties of matter and spacetime.”
14. **Athena Multimessenger Workshop**, *11/2018*, Alicante, Spain  
“Prospects for multimessenger observations with future gravitational-wave observatories.”
13. **MITP Sound of Spacetime Workshop**, *06/2018*, Mainz, Germany  
“Gravitational-wave memory effects: Observables and prospects for measurement.”
12. **ULB Solvay Workshop, Infrared Physics**, *05/2018*, Brussels, Belgium  
“Gravitational-wave memory effects: Observables and prospects for measurement.”
11. **Perimeter Institute, Strong-Gravity Seminar**, *02/2018*, Waterloo, Canada  
“Gravitational waves: Exploring the strongly curved side of the Universe.”
10. **University of Guelph, Physics Colloquium**, *02/2018*, Guelph, Canada  
“Gravitational waves: Exploring the strongly curved side of the Universe.”
9. **Jena University, Quantum & Gravitational Fields Seminar**, *01/2018*, Jena, Germany  
“Spin memory effect and charges of the extended BMS algebra.”
8. **Nikhef, PAX Workshop**, *08/2017*, Amsterdam, Netherlands  
“Gravitational-wave memory effects: Testing general relativity by measuring non-oscillatory gravitational waves from binary black holes.”
7. **Nordita, Physics of Extreme-Gravity Stars**, *06/2017*, Stockholm, Sweden  
“Testing general relativity with the LIGO observations of binary black holes.”
6. **AEI Postdam, Astrophysical Relativity Seminar**, *12/2016*, Postdam, Germany  
“Gravitational-wave memory observables and charges of the extended BMS algebra”
5. **University of Southampton Gravity Seminar**, *11/2016*, Southampton, UK  
“Gravitational-wave memory observables and charges of the extended BMS algebra”
4. **NPCSM Workshop, YITP, Kyoto University**, *11/2016*, Kyoto, Japan  
“Gravitational-wave memory observables and charges of the extended BMS algebra”
3. **Kavli IPMU, Mathematics–String-Theory Seminar**, *10/2016*, Tokyo, Japan  
“Gravitational-wave memory observables and charges of the extended BMS algebra”
2. **Radboud IMAPP Quantum Gravity Seminar**, *10/2016*, Nijmegen, Netherlands  
“Gravitational-wave memory observables and charges of the extended BMS algebra”
1. **Claremont Colleges Mathematics Colloquium**, *02/2011*, Claremont, CA, USA  
“Black-Hole Binaries: Observing, Visualizing, and Understanding Strongly Curved, Dynamical Spacetime”

**Contributed Talks**

17. **GWverse Global Meeting**, *01/2018*, Valetta, Malta  
“Gravitational-wave spin memory effect for compact binaries.”



16. **Physics of Extreme-Gravity Stars**, *06/2017*, Stockholm, Sweden  
“Gravitational-wave displacement and spin memory effects.”
15. **6<sup>th</sup> Dutch-Belgian GW Meeting**, *03/2017*, Leuven, Belgium  
“Spin memory effect for compact binaries”
14. **GrAMPa Workshop**, *08/2016*, Paris, France  
“Gravitational-wave memory observables”
13. **GR21 Meeting**, *07/2016*, New York City, NY, USA  
“Conserved charges of the extended Bondi-Metzner-Sachs algebra”
12. **American Physical Society April Meeting**, *04/2016*, Salt Lake City, UT, USA  
“Methods for measuring and transporting angular momentum in general relativity”
11. **Eastern Gravity Meeting**, *05/2015*, Rochester, NY, USA  
“Subleading gravitational-wave memory effects”
10. **Eastern Gravity Meeting**, *05/2014*, Morgantown, WV, USA  
“Ambiguity in angular momentum and its relationship to gravitational-wave memory”
9. **American Physical Society April Meeting**, *04/2014*, Savannah, GA, USA  
“Ambiguity in angular momentum and its relationship to gravitational-wave memory”
8. **American Physical Society April Meeting**, *04/2012*, Atlanta, GA, USA  
“Tendex and Vortex Lines of Perturbed Schwarzschild and Kerr Black Holes”
7. **Pacific Coast Gravity Meeting**, *03/2012*, Santa Barbara, CA, USA  
“Tendex and Vortex Lines of Black-Hole Spacetimes”
6. **American Physical Society April Meeting**, *04/2011*, Anaheim, CA, USA  
“Vortex and Tendex Lines in Post-Newtonian and Black-Hole Perturbation Spacetimes”
5. **Pacific Coast Gravity Meeting**, *03/2011*, Pasadena, CA, USA  
“Vortex and Tendex Lines in Post-Newtonian and Black-Hole Perturbation Spacetimes”
4. **Pacific Coast Gravity Meeting**, *03/2010*, San Diego, CA, USA  
“A Hybrid Approximation Technique for Head-on Black-Hole-Binary Mergers”
3. **American Physical Society April Meeting**, *02/2010*, Washington DC, USA  
“A Hybrid Approximation Technique for Head-on Binary-Black-Hole Mergers”
2. **American Physical Society April Meeting**, *05/2009*, Denver, CO, USA  
“Momentum Flow in Inspiring Binary Black Holes”
1. **Pacific Coast Gravity Meeting**, *03/2009*, Eugene, OR, USA  
“Momentum Flow in Black-Hole Binaries: Post-Newtonian Approximation”

### Sessions Chaired

3. **2017 Dutch Astronomy Conference**, *05/2017*, Nijmegen, Netherlands  
“Plenary Session 6”
2. **Fall 2016 NOVA NW3 Meeting**, *09/2016*, Nijmegen, Netherlands  
“Session 1: Compact Objects”
1. **American Physical Society April Meeting**, *04/2016*, Salt Lake City, UT, USA  
Session X18: Dynamics and Observables of Curved Spacetime.

### Outreach Talks

5. **Radboud Huygens Colloquium**, *10/2017*, Nijmegen, Netherlands  
“The discovery of a binary neutron star merger”
4. **ICMS Nobel Prizes 2017 Evening**, *10/2017*, Eindhoven, Netherlands  
“The 2017 Nobel Prize in Physics”

3. **Cornell Astro REU Gravitational Waves Workshop**, *06/2015*, Ithaca, NY, USA  
“Detecting Gravitational Waves with Laser Interferometry”
2. **Cornell Astro REU Gravitational Waves Workshop**, *07/2014*, Ithaca, NY, USA  
“Detecting Gravitational Waves with Laser Interferometry”
1. **Cornell Astro REU Gravitational Waves Workshop**, *07/2013*, Ithaca, NY, USA  
“Detecting Gravitational Waves with Laser Interferometry”

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