

Stephen R. Taylor | Publications

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Counts: 52 papers published in major peer-reviewed journals
(out of which 12 are first-authored papers, and 4 papers were covered by press releases).

- **Total number of citations:** 3973 (using Google Scholar), **h-index:** 31, **i10-index:** 47
- **Metrics** available at Google Scholar: <http://bit.ly/2hgVCzb>.
- **Full list of publications** can be found below, and at <http://bit.ly/2fF3yGl>.

Articles with significant student leadership (at time of publication) have student names underlined.

Submitted.....

4. "Discriminating between different scenarios for the formation and evolution of massive black holes with LISA"
A. Toubiana, K. W. K. Wong, S. Babak, E. Barausse, E. Berti, J. R. Gair, S. Marsat, **S. R. Taylor**
[arXiv:2106.13819](https://arxiv.org/abs/2106.13819)
3. "Searching For Gravitational Waves From Cosmological Phase Transitions With The NANOGrav 12.5-year dataset"
Z. Arzoumanian, P. T. Baker, H. Blumer [and 62 others, including **S. R. Taylor** in core analysis team]
[arXiv:2104.13930](https://arxiv.org/abs/2104.13930)
• 13 citations.
2. "Bayesian Forecasts for Dark Matter Substructure Searches with Mock Pulsar Timing Data"
V. S. H. Lee, **S. R. Taylor**, T. Trickle, K. M. Zurek
[arXiv:2104.05717](https://arxiv.org/abs/2104.05717)
• 4 citations.
1. "Mapping the Gravitational-wave Sky with LISA: A Bayesian Spherical Harmonic Approach"
S. Banagiri, A. Criswell, T. Kuan, V. Mandic, J. D. Romano, **S. R. Taylor**
[arXiv:2103.00826](https://arxiv.org/abs/2103.00826)

Publications in major peer-reviewed journals.....

52. "The NANOGrav 11 yr Data Set: Limits on Supermassive Black Hole Binaries in Galaxies within 500 Mpc"
Z. Arzoumanian, P. T. Baker, A. Brazier [and 53 others, including **S. R. Taylor**]
[The Astrophysical Journal](https://doi.org/10.3847/15384357.2021.411111), **914**, 2 (2021)
• 6 citations.
51. "Astrophysics Milestones for Pulsar Timing Array Gravitational-wave Detection"
N. Pol, **S. R. Taylor**, L. Z. Kelley, [and 49 others]
[The Astrophysical Journal Letters](https://doi.org/10.3847/2031-9374/abf8b1), **911**, 2 (2021)
• 18 citations.
50. "The NANOGrav 12.5-year Data Set: Wideband Timing of 47 Millisecond Pulsars"
Md F. Alam, Z. Arzoumanian, P. T. Baker, [and 67 others, including **S. R. Taylor**]
[The Astrophysical Journal Supplement Series](https://doi.org/10.3847/15384357.2021.411111), **252**, 1 (2021)
• 34 citations.
49. "The NANOGrav 12.5-year Data Set: Observations and Narrowband Timing of 47 Millisecond Pulsars"

- Md F. Alam, Z. Arzoumanian, P. T. Baker, [and 67 others, including **S. R. Taylor**]
[The Astrophysical Journal Supplement Series](#), **252**, 1 (2021)
 • 30 citations.
48. “*The NANOGrav 12.5-year Data Set: Search For An Isotropic Stochastic Gravitational-Wave Background*”
 Z. Arzoumanian, P. T. Baker, H. Blumer, [and 58 others, including **S. R. Taylor**]
[The Astrophysical Journal Letters](#), **905**, 2 (2020)
 • 216 citations.
47. “*From Bright Binaries To Bumpy Backgrounds: Mapping Realistic Gravitational Wave Skies With Pulsar-Timing Arrays*”
S. R. Taylor, R. van Haasteren, A. Sesana
[Physical Review D](#), **102**, 8 (2020)
 • 12 citations.
46. “*Pulsar Timing Array Constraints on the Merger Timescale of Subparsec Supermassive Black Hole Binary Candidates*”
 K. Nguyen, T. Bogdanovic, J. C. Runnoe, **S. R. Taylor**, A. Sesana, M. Eracleous, S. Sigurdsson
[The Astrophysical Journal Letters](#), **900**, 2 (2020)
 • 4 citations.
45. “*Multi-Messenger Gravitational Wave Searches with Pulsar Timing Arrays: Application to 3C66B Using the NANOGrav 11-year Data Set*”
 Z. Arzoumanian, P. T. Baker, A. Brazier, [and 52 others, including **S. R. Taylor**]
[The Astrophysical Journal](#), **900**, 2 (2020)
 • 12 citation.
44. “*Modeling the Uncertainties of Solar System Ephemerides for Robust Gravitational-wave Searches with Pulsar-timing Arrays*”
 M. Vallisneri, **S. R. Taylor**, J. Simon, [and 61 others]
[The Astrophysical Journal](#), **893**, 2 (2020)
 • 14 citations.
43. “*Pulsar timing array signals induced by black hole binaries in relativistic eccentric orbits*”
 A. Susobhanan, A. Gopakumar, G. Hobbs, **S. R. Taylor**
[Physical Review D](#), **101**, 4 (2020)
 • 3 citations.
42. “*A pulsar-based time-scale from the International Pulsar Timing Array*”
 G. Hobbs, L. Guo, R. N. Caballero, [and 56 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **491**, 4 (2020)
 • 17 citations.
41. “*The NANOGrav 11 yr Data Set: Evolution of Gravitational-wave Background Statistics*”
 J. S. Hazboun, J. Simon, **S. R. Taylor**, [and 60 others]
[The Astrophysical Journal](#), **890**, 2 (2020)
 • 12 citations.
40. “*The NANOGrav 11 yr Data Set: Limits on Gravitational Wave Memory*”
 K. Aggarwal, Z. Arzoumanian, P. T. Baker, [and 58 others, including **S. R. Taylor**]
[The Astrophysical Journal](#), **889**, 1 (2020)
 • 23 citations.
39. “*The International Pulsar Timing Array: second data release*”
 B. B. Perera, M. E. DeCesar, P. B. Demorest, [and 72 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **490**, 4 (2019)
 • 98 citations.
38. “*Bayesian cross validation for gravitational-wave searches in pulsar-timing array data*”
 H. Wang, **S. R. Taylor**, M. Vallisneri
[Monthly Notices of the Royal Astronomical Society](#), **487**, 3 (2019)
 • 2 citations.

37. “*The NANOGrav 11-Year Data Set: Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries*”
K. Aggarwal, Z. Arzoumanian, P. T. Baker, [and 60 others, including **S. R. Taylor**]
[The Astrophysical Journal](#), **880**, 1 (2019)
• 71 citations.
36. “*Constraining alternative polarization states of gravitational waves from individual black hole binaries using pulsar timing arrays*”
L. O’Beirne, N. J. Cornish, S. J. Vigeland, **S. R. Taylor**
[Physical Review D](#), **99**, 124039 (2019)
• 7 citations.
35. “*Catching Gravitational Waves With A Galaxy-sized Net Of Pulsars*”
S. R. Taylor
[Frontiers For Young Minds](#), **7**:80 (2019)
• 1 citation. Pedagogical article aimed at K-12 audience.
34. “*The Astrophysics Of Nanohertz Gravitational Waves*”
S. Burke-Spolaor, **S. R. Taylor**, [and 13 others]
[The Astronomy and Astrophysics Review \(A&ARv\)](#), **27**, 1 (2019)
• 81 citations. Comprehensive field review.
33. “*Mining Gravitational-wave Catalogs To Understand Binary Stellar Evolution: A New Hierarchical Bayesian Framework*”
S. R. Taylor and D. Gerosa
[Physical Review D](#), **98**, 083017 (2018)
• 43 citations. Featured in PRD’s Kaleidoscope review of October 2018.
32. “*Studying the solar system with the International Pulsar Timing Array*”
R. N. Caballero, Y. J. Guo, K. J. Lee, [and 77 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **481**, 4 (2018)
• 15 citations.
31. “*The noise-marginalized optimal statistic: A robust hybrid frequentist-Bayesian statistic for the stochastic gravitational-wave background in pulsar timing arrays*”
S. J. Vigeland, K. P. Islo, **S. R. Taylor**, J. A. Ellis
[Physical Review D](#), **98**, 044003 (2018)
• 7 citations.
30. “*Improving timing sensitivity in the microhertz frequency regime: limits from PSR J1713+0747 on gravitational waves produced by super-massive black-hole binaries*”
B. B. P. Perera, B. W. Stappers, S. Babak, [and 25 others. including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **478**, 1 (2018)
• 8 citations.
29. “*The NANOGrav 11-year Data Set: Pulsar-timing Constraints On The Stochastic Gravitational-wave Background*”
Z. Arzoumanian, P. T. Baker, A. Brazier, [and 57 others. **Corresponding author: S. R. Taylor**]
[The Astrophysical Journal](#), **859**, 1 (2018)
• 246 citations.
28. “*The NANOGrav 11-year Data Set: High-precision timing of 45 Millisecond Pulsars*”
Z. Arzoumanian, A. Brazier, S. Burke-Spolaor, [and 53 others, including **S. R. Taylor**]
[The Astrophysical Journal Supplement Series](#), **235**, 2 (2018)
• 281 citations.
27. “*Constraining alternative theories of gravity using pulsar timing arrays*”
N. J. Cornish, L. O’Beirne, **S. R. Taylor**, N. Yunes
[Physical Review Letters](#), **120**, 181101 (2018)
• 20 citations.
26. “*Single Sources in the Low-Frequency Gravitational Wave Sky: properties and time to detection by pulsar timing arrays*”

- L. Z. Kelley, L. Blecha, L. Hernquist, A. Sesana, **S. R. Taylor**
[Monthly Notices of the Royal Astronomical Society](#), **477**, 1 (2018)
 • 36 citations.
25. “*The Local Nanohertz Gravitational-Wave Landscape From Supermassive Black Hole Binaries*”
 C. Mingarelli, J. Lazio, A. Sesana, J. E. Greene, J. A. Ellis, C. P. Ma, S. Croft, S. Burke-Spolaor, **S. R. Taylor**
[Nature Astronomy](#), **Vol. 1**, p. 886-892 (2017)
 • 69 citations. Press release.
24. “*The gravitational wave background from massive black hole binaries in Illustris: spectral features and time to detection with pulsar timing arrays*”
 L. Z. Kelley, L. Blecha, L. Hernquist, A. Sesana, **S. R. Taylor**
[Monthly Notices of the Royal Astronomical Society](#), **471**, 4 (2017)
 • 62 citations.
23. “*Constraints on the dynamical environments of supermassive black-hole binaries using pulsar-timing arrays*”
S. R. Taylor, J. Simon, L. Sampson.
[Physical Review Letters](#), **118**, 181102 (2017)
 • 29 citations.
22. “*All correlations must die: assessing the significance of a stochastic gravitational-wave background in pulsar timing arrays*”
S. R. Taylor, L. Lentati, S. Babak, S. P. Brem, J. R. Gair, A. Sesana, A. Vecchio
[Physical Review D](#), **95**, 042002 (2017)
 • 25 citations.
21. “*High-precision timing of 42 millisecond pulsars with the European Pulsar Timing Array*”
 G. Desvignes, R. N. Caballero, L. Lentati, [and 40 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **458**, 3 (2016)
 • 179 citations.
20. “*From spin noise to systematics: stochastic processes in the first International Pulsar Timing Array data release*”
 L. Lentati, R. M. Shannon, W. A. Coles, [and 80 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **458**, 2 (2016)
 • 58 citations.
19. “*The International Pulsar Timing Array: first data release*”
 J. P. W. Verbiest, L. Lentati, G. Hobbs, [and 89 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **458**, 2 (2016)
 • 238 citations.
18. “*The NANOGrav nine-year data set: limits on the isotropic stochastic gravitational wave background*”
 Z. Arzoumanian, A. Brazier, S. Burke-Spolaor, [and 48 others, including **S. R. Taylor**]
[The Astrophysical Journal](#), **821**, 1 (2016)
 • 210 citations. Press release.
17. “*The noise properties of 42 millisecond pulsars from the European Pulsar Timing Array and their impact on gravitational-wave searches*”
 R. N. Caballero, K. J. Lee, L. Lentati, [and 36 others, including **S. R. Taylor**]
[Monthly Notices of the Royal Astronomical Society](#), **457**, 4 (2016)
 • 37 citations.
16. “*Are we there yet? Time to detection of nanohertz gravitational waves based on pulsar-timing array limits*”
S. R. Taylor, M. Vallisneri, J. A. Ellis, C. M. F. Mingarelli, T. J. W. Lazio, and R. van Haasteren
[The Astrophysical Journal Letters](#), **819**, 1 (2016)
 • 77 citations. Press release, and cited in popular-science book.
15. “*Detecting eccentric supermassive black hole binaries with pulsar timing arrays: resolvable source strategies*”
S. R. Taylor, E. A. Huerta, J. R. Gair, and S. T. McWilliams
[The Astrophysical Journal](#), **817**, 1 (2016)
 • 22 citations.

14. *"European Pulsar Timing Array limits on continuous gravitational waves from individual supermassive black hole binaries"*
S. Babak, A. Petiteau, A. Sesana, P. Brem, P. A. Rosado, **S. R. Taylor**, [and 30 others]
[Monthly Notices of the Royal Astronomical Society](#), **455**, 2 (2016)
• 120 citations.
13. *"Mapping gravitational-wave backgrounds of arbitrary polarisation using pulsar timing arrays"*
J. R. Gair, J. D. Romano, and **S. R. Taylor**
[Physical Review D](#), **92**, 102003 (2015)
• 25 citations.
12. *"European Pulsar Timing Array limits on an isotropic stochastic gravitational-wave background"*
L. Lentati, **S. R. Taylor**, C. M. F. Mingarelli, [and 33 others]
[Monthly Notices of the Royal Astronomical Society](#), **453**, 3 (2015)
• 304 citations.
11. *"Detection of eccentric supermassive black hole binaries with pulsar timing arrays: signal-to-noise ratio calculations"*
E. A. Huerta, S. T. McWilliams, J. R. Gair, and **S. R. Taylor**
[Physical Review D](#), **92**, 063010 (2015)
• 37 citations.
10. *"Phase-coherent mapping of gravitational-wave backgrounds using ground-based laser interferometers"*
J. D. Romano, **S. R. Taylor**, N. J. Cornish, J. Gair, C. M. F. Mingarelli, and R. van Haasteren
[Physical Review D](#), **92**, 042003 (2015)
• 18 citations.
9. *"Limits on anisotropy in the nanohertz stochastic gravitational wave background"*
S. R. Taylor, C. M. F. Mingarelli, J. R. Gair, [and 32 others]
[Physical Review Letters](#), **115**, 041101 (2015)
• 45 citations.
8. *"Estimating the sensitivity of pulsar timing arrays"*
C. J. Moore, **S. R. Taylor**, and J. R. Gair
[Classical and Quantum Gravity](#), **32**, 5 (2015)
• 37 citations.
7. *"Accelerated Bayesian model-selection and parameter-estimation in continuous gravitational-wave searches with pulsar-timing arrays"*
S. R. Taylor, J. A. Ellis, and J. R. Gair
[Physical Review D](#), **90**, 104028 (2014)
• 27 citations.
6. *"Mapping gravitational-wave backgrounds using methods from CMB analysis: Application to pulsar timing arrays"*
J. R. Gair, J. D. Romano, **S. R. Taylor**, and C. M. F. Mingarelli
[Physical Review D](#), **90**, 082001 (2014)
• 56 citations. PRD Editors' Suggestion.
5. *"Searching for anisotropic gravitational-wave backgrounds using pulsar timing arrays"*
S. R. Taylor and J. R. Gair
[Physical Review D](#), **88**, 084001 (2013)
• 55 citations.
4. *"Hyper-efficient model-independent Bayesian method for the analysis of pulsar timing data"*
L. Lentati, P. Alexander, M. P. Hobson, **S. R. Taylor**, J. Gair, S. T. Balan, and R. van Haasteren
[Physical Review D](#), **87**, 104021 (2013)
• 61 citations.
3. *"Weighing the evidence for a gravitational-wave background in the first International Pulsar Timing Array data challenge"*
S. R. Taylor, J. R. Gair, and L. Lentati

- Physical Review D, **87**, 044035 (2013)
 • 14 citations.
2. "Cosmology with the lights off: standard sirens in the Einstein Telescope era"
S. R. Taylor and J. R. Gair
 Physical Review D, **86**, 023502 (2012)
 • 102 citations.
1. "Cosmology using advanced gravitational-wave detectors alone"
S. R. Taylor, J. R. Gair, and I. Mandel
 Physical Review D, **85**, 023535 (2012)
 • 96 citations.

Books, book chapters, conference proceedings, white papers, and online articles.....

11. "The Nanohertz Gravitational Wave Astronomer"
S. R. Taylor
 Technical book to be published by Taylor & Francis, arXiv:2105.13270
10. "Inferring the properties of a population of compact binaries in presence of selection effects"
 S. Vitale, D. Gerosa, W. M. Farr, **S. R. Taylor**
 Chapter of "Handbook of Gravitational Wave Astronomy" [Eds. C. Bambi, S. Katsanevas, K. Kokkotas; Springer Singapore, (2021)], arXiv:2007.05579
9. "Fundamental Physics with Pulsar Timing Arrays"
 X. Siemens, J. Hazboun, P. T. Baker, S. Burke-Spolaor, T. Dolch, E. Howard, D. R. Madison, C. Mingarelli, J. Simon, T. Smith, **S. R. Taylor**; for the NANOGrav Collaboration
 Submitted to the Particle Physics Community Planning Exercise (a.k.a "SnowMass") 2021 LOI call
8. "NANOGrav Education and Outreach: Growing a Diverse and Inclusive Collaboration for Low-Frequency Gravitational Wave Astronomy"
 The NANOGrav Collaboration; P. T. Baker, H. Blumer, A. Brazier, S. Chatterjee, B. Christy, F. Crawford, M. E. DeCesar, T. Dolch, N. E. Garver-Daniels, J. S. Hazboun, K. Holley-Bockelmann, D. L. Kaplan, J. S. Key, T. C. Klein, M. T. Lam, N. Lewandowska, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, N. McMann, J. Page, N. T. Palliyaguru, J. D. Romano, X. Siemens, J. K. Swiggum, **S. R. Taylor**, K. Williamson
 Submitted to the Astronomy & Astrophysics 2020 Decadal Survey (2019), arXiv:1907.07348
7. "The NANOGrav Program for Gravitational Waves and Fundamental Physics"
 A. Brazier, S. Chatterjee, T. Cohen, J. M. Cordes, M. E. DeCesar, P. B. Demorest, J. S. Hazboun, M. T. Lam, R. S. Lynch, M. A. McLaughlin, S. M. Ransom, X. Siemens, **S. R. Taylor**, S. J. Vigeland
 Submitted to the Astronomy & Astrophysics 2020 Decadal Survey (2019), arXiv:1908.05356
6. "Supermassive Black-hole Demographics & Environments With Pulsar Timing Arrays"
S. R. Taylor, S. Burke-Spolaor, P. T. Baker, M. Charisi, K. Islo, L. Z. Kelley, D. R. Madison, J. Simon, S. Vigeland
 Submitted to the Astronomy & Astrophysics 2020 Decadal Survey (2019), arXiv:1903.08183
5. "Astro2020 Science White Paper: The Next Decade of Astrominformatics and Astrostatistics"
 A. Siemiginowska, G. Eadie, I. Czekala, [and 49 others, including **S. R. Taylor**]
 Submitted to the Astronomy & Astrophysics 2020 Decadal Survey (2019), arXiv:1903.06796
4. "From Megaparsecs To Milliparsecs: Galaxy Evolution & Supermassive Black Holes with NANOGrav and the ngVLA"
S. R. Taylor and J. Simon
 Science With A Next-Generation Very Large Array [ngVLA science book] (2018)
3. "Solar System Ephemerides, Pulsar Timing, Gravitational Waves, & Navigation"
 T. J. W. Lazio, S. Bhaskaran, C. Cutler, W. M. Folkner, R. S. Park, J. A. Ellis, T. Ely, **S. R. Taylor**, M. Vallisneri
 Pulsar Astrophysics the Next Fifty Years, Proceedings of the International Astronomical Union, IAU Symposium, Volume 337, pp. 150-153 (2018)

2. “*Summary of Session C1: pulsar timing arrays*”
R. M. Shannon, S. Chamberlin, N. J. Cornish, J. A. Ellis, C. M. F. Mingarelli, D. Perrodin, P. Rosado, A. Sesana, **S. R. Taylor**, [and 14 others]
[General Relativity and Gravitation](#), **46**:1765 (2014)
1. “*Using Swarm Intelligence To Accelerate Pulsar Timing Analysis*”
S. R. Taylor, J. R. Gair, L. Lentati
[arXiv:1210.3489](#) (2012)