ERIC THRANE

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EDUCATION

University of Washington, Seattle, WA *2003–2008*
PhD, Physics
A Search for Astrophysical Neutrino Point Sources with Super-Kamiokande
Advisor: R Jeffrey Wilkes

University of Michigan, Ann Arbor, MI *1999–2003*
BS, Physics with Highest Honors (& BA, Philosophy)
Flat Electron Beam Dynamics: A Comparison of Data with Simulation
Advisor: David Gerdes

RESEARCH INTERESTS

Astrophysics, gravitational waves, cosmology

WORK EXPERIENCE

Professor 2020–
School of Physics & Astronomy, Monash University *Clayton, VIC*

Associate Professor 2018–2020
School of Physics & Astronomy, Monash University *Clayton, VIC*

Data Theme Leader 2017–
ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) *Clayton, VIC*

Senior Lecturer 2017–2018
School of Physics & Astronomy, Monash University *Clayton, VIC*

Lecturer 2015–2016
School of Physics & Astronomy, Monash University *Clayton, VIC*

Senior Postdoctoral Scholar 2012–2014
Division of Physics, California Institute of Technology *Pasadena, CA*

Postdoctoral Research Associate 2008–2012
Dept. of Physics & Astronomy, University of Minnesota *Minneapolis, MN*

Teaching and Research Assistant 2003–2008
Dept. of Physics, University of Washington *Seattle, WA*

AWARDS & FELLOWSHIPS

ARC Linkage Infrastructure, Equipment and Facilities (LIEF; LE210100002) 2021

· Australian Partnership in Advanced LIGO+ ($3M AUD for 12 investigators)

Rising stars (*The Australian*) 2019

· Australia's top 40 researchers who are less than 10 years into their careers

The ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) 2016–2023

· $31M AUD for 19 researchers; CE170100004

Breakthrough Prize in Fundamental Physics 2016

· $2M USD split between members of the LIGO Scientific Collaboration

Gruber Cosmology Prize 2016

· Ron Drever, Kip Thorne, Rai Weiss, and the LIGO Science Collaboration

ARC Future Fellowship (FT150100281) 2015–2019

· Gravitational-wave astronomy: detection and beyond ($618K AUD)

Ken Young Fellow 2003
University of Washington *Seattle, WA*

Graduated with Highest Honors 2003
University of Michigan *Ann Arbor, MI*

SELECT PUBLICATIONS

With significant personal contribution; my group members are highlighted in bold.

★ = lead and/or corresponding author

[1] V. Kalogera *et al.*, *The Next Generation Global Gravitational Wave Observatory: The Science Book*, (2021) arxiv/2111.06990.

[2] R. Abbott *et al.*, *GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run*, (2021) arxiv/2111.03606.

[3] R. Abbott *et al.*, *The population of merging compact binaries inferred using gravitational waves through GWTC-3*, (2021) arxiv/2111.03634.

[4] R. Abbott *et al.*, *Constraints on the cosmic expansion history from GWTC-3*, (2021) arxiv/2111.03604.

[5] **A. Vajpeyi**, E. Thrane, **R. Smith**, B. McKernan, and K. S. Ford, *Measuring the properties of active galactic nuclei disks with gravitational waves*, (2021) arxiv/2111.03992.

[6] P. D. Lasky and E. Thrane, *Did goryachev et al. detect megahertz gravitational waves?*, *Phys. Rev. D* **104** (2021) 103017.

[7] **S. Galaudage**, C. Talbot, **T. Nagar**, D. Jain, E. Thrane, and I. Mandel, *Building better spin models for merging binary black holes: Evidence for non-spinning and rapidly spinning nearly aligned sub-populations*, *Astrophys. J. Lett.* **921** (2021) L15.

[8] R. Essick, A. Farah, **S. Galaudage**, C. Talbot, M. Fishbach, E. Thrane, and D. E. Holz, *Don't just leave-one-out: Probing extremal gravitational-wave events with coarse-grained likelihoods*, *Accepted for publication in Astrophys. J.* (2021) arxiv/2109.00418.

[9] **I. M. Romero-Shaw**, P. D. Lasky, and E. Thrane, *Signs of eccentricity in two gravitational-wave signals may indicate a sub-population of dynamically assembled binary black holes*, *Astrophys. J. Lett.* **921** (2021) L31.

[10] **E. Payne**, L. Sun, K. Kremer, P. D. Lasky, and E. Thrane, *The imprint of superradiance on hierarchical black hole mergers*, (2021) arxiv/2107.11730.

[11] B. Goncharov *et al.*, *On the evidence for a common-spectrum process in the search for the nanohertz gravitational wave background with the Parkes Pulsar Timing Array*, *Astrophys. J. Lett.* **917** (2021) L19.

[12] **A. Vajpeyi**, **R. Smith**, E. Thrane, *et al.*, *A search for intermediate-mass black holes mergers in the second LIGO–Virgo observing run with the Bayes Coherence Ratio*, (2021) arxiv/2107.12109.

[13] B. McKernan, K. E. S. Ford, T. Callister, W. M. Farr, R. O'Shaughnessy, **R. Smith**, E. Thrane, and **A. Vajpeyi**, *LIGO–Virgo correlations between mass ratio and effective inspiral spin: testing the active galactic nuclei channel*, (2021) arxiv/2107.07551.

[14] **R. Willcox**, I. Mandel, E. Thrane, A. Deller, S. Stevenson, and A. Vigna-Gómez, *Constraints on weak supernova kicks from observed pulsar velocities*, *Astrophys. J. Lett.* **920** (2021) L37.

[15] R. Abbott *et al.*, *Observation of gravitational waves from two neutron starblack hole coalescences*, *Astrophys. J. Lett.* **915** (2021) L5.

[16] C. Talbot, E. Thrane, S. Biscoveanu, and **R. Smith**, *Inference with finite time series: Observing the gravitational Universe through windows*, *Phys. Rev. Res.* **3** (2021) 043049.

[17] M. Zevin, **I. M. Romero-Shaw**, K. Kremer, E. Thrane, and P. D. Lasky, *Implications of eccentric observations on binary black hole formation channels*, *Astrophys. J. Lett.* **921** (2021) L43.

[18] R. Abbott *et al.*, *Constraints on Cosmic Strings Using Data from the Third Advanced LIGO–Virgo Observing Run*, *Phys. Rev. Lett.* **126** (2021) 241102.

[19] **Z.-Q. You**, G. Ashton, **X.-J. Zhu**, E. Thrane, and Z.-H. Zhu, *Optimized localization for gravitational-waves from merging binaries*, *Accepted for publication in Mon. Not. R. Ast. Soc.* (2021) arxiv/2105.04263.

[20] **M. Hübner**, P. D. Lasky, and E. Thrane, *Memory remains undetected: Updates from the second LIGO/Virgo gravitational-wave transient catalog*, *Phys. Rev. D* **104** (2021) 023004.

[21] J. Paynter, R. Webster, and E. Thrane, *Evidence for an intermediate-mass black hole from a gravitationally lensed gamma-ray burst*, *Nat. Astron.* (2021) https://doi.org/10.1038/s41550-021-01307-1.

[22] **R. Smith** *et al.*, *Bayesian inference for gravitational waves from binary neutron star mergers in third-generation observatories*, *Phys. Rev. Lett.* **127** (2021) 081102.

[23] **F. Hernandez-Vivanco**, P. D. Lasky, E. Thrane, **R. Smith**, D. Chatterjee, S. Banik, T. Motta, and A. Thomas, *Temperature dependent appearance of exotic matter makes nascent neutron stars spin faster*, (2021) arxiv/2101.04782.

[24] **C. Talbot** and E. Thrane, *Fast, flexible, and accurate evaluation of malmquist bias with machine learning: Preparing for the pending flood of gravitational-wave detections*, (2020) arxiv/2012.01317.

[25] **I. M. Romero-Shaw**, K. Kremer, P. D. Lasky, E. Thrane, and J. Samsing, *Gravitational waves as a probe of globular cluster formation and evolution*,.

[26] C. Kimball, C. Talbot, C. P. Berry, M. Zevin, E. Thrane, *et al.*, *Evidence for hierarchical black hole mergers in the second LIGO–Virgo gravitational-wave catalog*, *Astrophys. J. Lett.* **915** (2021) L35.

[27] **S. Galaudage**, **C. Adamcewicz**, **X.-J. Zhu**, S. Stevenson, and E. Thrane, *Heavy double neutron stars: birth, mid-life and death*, *Astrophys. J. Lett.* **909** (2021) L19.

[28] C. D. Blair, Y. Levin, and E. Thrane, *Constraining temperature distribution inside LIGO test masses from frequencies of their vibrational modes*, *Phys. Rev. D* **103** (2021) 022003.

[29] R. Abbott *et al.*, *GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run*, *Phys. Rev. X* **11** (2021) 021053.

[30] R. Abbott *et al.*, *Population properties of compact objects from the second LIGO-Virgo Gravitational-Wave Transient Catalog*, *Astrophys. J. Lett.* **913** (2021) L7 Focus Issue: Gravitational-wave Astrophysics from the Second LIGO-Virgo Transient Catalog.

[31] **B. Goncharov** *et al.*, *Identifying and mitigating noise sources in precision pulsar timing data sets*, *Mon. Not. R. Ast. Soc.* **502** (2020) 478.

[32] J. Calderón Bustillo, P. D. Lasky, and E. Thrane, *Black-hole spectroscopy, the no-hair theorem and GW150914: Kerr vs. Occam*, *Phys. Rev. D* **103** (2021) 024041.

[33] **E. Payne**, C. Talbot, P. D. Lasky, E. Thrane, and J. S. Kissel, *Gravitational-wave astronomy with a physical calibration model*, *Phys. Rev. D* **102** (2020) 122004.

[34] **I. M. Romero-Shaw**, P. D. Lasky, E. Thrane, and J. Calderón Bustillo, *GW190521: orbital eccentricity and signatures of dynamical formation in a binary black hole merger signal*, *Astrophys. J. Lett.* **903** (2020) L5.

[35] **S. Biscoveanu**, **C. Talbot**, E. Thrane, and **R. Smith**, *Measuring the primordial gravitational-wave background in the presence of astrophysical foregrounds*, *Phys. Rev. Lett.* **125** (2020) 241101.

[36] R. Abbott *et al.*, *GW190521: A Binary Black Hole Merger with a Total Mass of* $150M_\odot$, *Phys. Rev. Lett.* **125** (2020) 101102.

[37] R. Abbott *et al.*, *Properties and Astrophysical Implications of the* $150M_\odot$ *Binary Black Hole Merger GW190521*, *Astrophys. J. Lett.* **900** (2020) L13.

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[39] K. Ackley *et al.*, (OzGrav), *Neutron Star Extreme Matter Observatory: A kilohertz-band gravitational-wave detector in the global network*, *Pub. Astron. Soc. Aust.* **37** (2020) e047.

[40] R. Abbott *et al.*, (LIGO–Virgo), *GW190814: Gravitational Waves from the Coalescence of a 23 Solar Mass Black Hole with a 2.6 Solar Mass Compact Object*, *Astrophys. J. Lett.* **896** (2020) L44.

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[42] C. Talbot and E. Thrane, *Gravitational-wave astronomy with an uncertain noise power spectral density*, *Phys. Rev. Res.* **2** (2020) 043298.

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[44] **I. M. Romero-Shaw**, **C. Talbot**, S. Biscoveanu, *et al.*, *Bayesian inference for compact binary coalescences with BILBY: Validation and application to the first LIGO–Virgo gravitational-wave transient catalogue*, *Mon. Not. R. Ast. Soc.* **499** (2020) 3295.

[45] C. Kimball, **C. Talbot**, C. P. L. Berry, M. Carney, M. Zevin, E. Thrane, and V. Kalogera, *Black hole genealogy: Identifying hierarchical mergers with gravitational waves*, *Astrophys. J.* **900** (2020) 177.

[46] **X.-J. Zhu** and E. Thrane, *Toward the unambiguous identification of supermassive binary black holes through Bayesian inference*, *Astrophys. J.* **900** (2020) 117.

[47] **R. J. E. Smith**, **C. Talbot**, **F. Hernandez Vivanco**, and E. Thrane, *Inferring the population properties of binary black holes from unresolved gravitational waves*, *Mon. Not. R. Ast. Soc.* **496** (2020) 3281.

[48] B. P. Abbott *et al.*, (LIGO–Virgo), *GW190412: Observation of a Binary-Black-Hole Coalescence with Asymmetric Masses*, *Phys. Rev. D* **102** (2020) 043015.

[49] **Z.-Q. You**, **X.-J. Zhu**, G. Ashton, E. Thrane, and Z.-H. Zhu, *Standard-siren cosmology using gravitational waves from binary black holes*, *Astrophys. J.* **908** (2020) 215 arxiv/2004.00036.

[50] **I. M. Romero-Shaw**, **N. Farrow**, S. Stevenson, E. Thrane, and **X.-J. Zhu**, *On the origin of GW190425*, *Mon. Not. R. Ast. Soc. Lett.* **496** (2020) L64.

[51] B. P. Abbott *et al.*, (LIGO–Virgo), *GW190425: Observation of a Compact Binary Coalescence with Total Mass* $\sim 3.4 M_{\odot}$, *Astrophys. J. Lett.* **892** (2020) L3.

[52] **S. Galaudage**, **C. Talbot**, and E. Thrane, *Gravitational-wave inference in the catalog era: evolving priors and marginal events*, *Phys. Rev. D* **102** (2019) 083026.

[53] **M. Hübner**, **C. Talbot**, P. D. Lasky, and E. Thrane, *Thanks for the memory: measuring gravitational-wave memory in the first LIGO/Virgo gravitational-wave transient catalog*, *Phys. Rev. D* **101** (2020) 023011.

[54] **A. K. Divakarla**, E. Thrane, P. D. Lasky, and B. F. Whiting, *Memory Effect or Cosmic String? Classifying Gravitational-Wave Bursts with Bayesian Inference*, *Phys. Rev. D* **102** (2020) 023010.

[55] **S. Biscoveanu**, E. Thrane, and S. Vitale, *Constraining short gamma-ray burst jet properties with gravitational waves and gamma rays*, *Astrophys. J.* **893** (2020) 38.

[56] E. Thrane, S. Osłowski, and P. D. Lasky, *Ultra-relativistic astrophysics using multi-messenger observations of double neutron stars with LISA and the SKA*, *Mon. Not. R. Ast. Soc.* **493** (2020) 5408 ★.

[57] **B. Goncharov**, **X.-J. Zhu**, and E. Thrane, *Is there a spectral turnover in the spin noise of millisecond pulsars?*, *Mon. Not. R. Ast. Soc.* **497** (2020) 3264.

[58] G. Ashton, E. Thrane, and **R. J. E. Smith**, *Gravitational wave detection without boot straps: a Bayesian approach*, *Phys. Rev. D* **100** (2019) 123018.

[59] **I. M. Romero-Shaw**, P. D. Lasky, and E. Thrane, *Searching for Eccentricity: Signatures of Dynamical Formation in the First Gravitational-Wave Transient Catalogue of LIGO and Virgo*, *Mon. Not. R. Ast. Soc.* **490** (2019) 5210.

[60] **F. Hernandez Vivanco**, **R. J. E. Smith**, E. Thrane, P. D. Lasky, **C. Talbot**, and V. Raymond, *Measuring the neutron star equation of state with gravitational waves: the first forty binary neutron star mergers*, *Phys. Rev. D* **100** (2019) 103009.

[61] S. Banagiri, M. W. Coughlin, J. Clark, P. D. Lasky, M. A. Bizouard, **C. Talbot**, E. Thrane, and V. Mandic, *Constraining the gravitational-wave afterglow from a binary neutron star coalescence*, *Mon. Not. R. Ast. Soc.* **492** (2020) 4945.

[62] **E. Payne**, **C. Talbot**, and E. Thrane, *Higher order gravitational-wave modes with likelihood reweighting*, *Phys. Rev. D* **100** (2019) 123017.

[63] **C. Talbot**, **R. J. E. Smith**, E. Thrane, and G. B. Poole, *Parallelized Inference for Gravitational-Wave Astronomy* , *Phys. Rev. D* **100** (2019) 043030.

[64] B. P. Abbott *et al.*, (LIGO–Virgo), *Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs*, *Phys. Rev. D* **100** (2019) 062001.

[65] **F. Hernandez Vivanco**, **R. J. E. Smith**, E. Thrane, and P. D. Lasky, *Accelerated detection of the binary neutron star gravitational-wave background*, *Phys. Rev. D* **100** (2019) 043023.

[66] B. P. Abbott *et al.*, (LIGO–Virgo), *A search for the isotropic stochastic background using data from Advanced LIGO's second observing run*, *Phys. Rev. D* **100** (2019) 061101(R).

[67] B. S. Sathyaprakash *et al.*, *Astro2020 science white paper: Cosmology and the early universe*, 2019. arxiv/1903.09260.

[68] **N. Farrow**, **X.-J. Zhu**, and E. Thrane, *The mass distribution of galactic double neutron stars*, *Astrophys. J.* **876** (2019) 18.

[69] B. P. Abbott *et al.*, (LIGO–Virgo), *Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo*, *Astrophys. J. Lett.* **882** (2019) L24.

[70] B. P. Abbott *et al.*, (LIGO–Virgo), *GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs*, *Phys. Rev. X* **9** (2019) 031040.

[71] D. Martynov, H. Miao, H. Yang, **F. Hernandez Vivanco**, E. Thrane, **R. J. E. Smith**, P. D. Lasky, W. E. East, R. Adhikari, A. Bauswein, A. Brooks, Y. Chen, T. C. H. Grote, Y. Levin, C. Zhao, and A. Vecchio, *Exploring the sensitivity of gravitational wave detectors to neutron star physics*, *Phys. Rev. D* **99** (2019) 102004.

[72] G. Ashton, M. Huebner, P. D. Lasky, **C. Talbot**, K. Ackley, **S. Biscoveanu**, Q. Chu, A. Divarkala, P. J. Easter, **B. Goncharov**, **F. Hernandez Vivanco**, J. Harms, M. E. Lower, **G. D. Meadors**, D. Melchor, E. Payne, M. D. Pitkin, J. Powell, N. Sarin, **R. J. E. Smith**, and E. Thrane, *Bilby: A user-friendly Bayesian inference library for gravitational-wave astronomy*, *Astrophys. J. Supp.* **241** (2019) 27.

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[74] **B. Goncharov** and E. Thrane, *An all-sky radiometer for narrowband gravitational waves using folded data*, *Phys. Rev. D* **98** (2018) 064018.

[75] **C. Talbot**, E. Thrane, P. D. Lasky, and F. Lin, *Gravitational-wave memory: waveforms and phenomenology*, *Phys. Rev. D* **98** (2018) 064031 Featured in Phys. Rev. D's 2018 Kaleidoscope.

[76] **M. E. Lower**, E. Thrane, P. D. Lasky, and **R. J. E. Smith**, *Measuring eccentricity in binary black hole inspirals with gravitational waves*, *Phys. Rev. D* **98** (2018) 083028.

[77] **X.-J. Zhu**, W. Cui, and E. Thrane, *The minimum and maximum gravitational-wave background from supermassive binary black holes*, *Mon. Not. R. Ast. Soc.* **482** (2018) 2588.

[78] P. B. Covas *et al.*, *Identification and mitigation of narrow spectral artifacts that degrade searches for persistent gravitational waves in the first two observing runs of Advanced LIGO*, *Phys. Rev. D* **97** (2018) 082002.

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[81] B. P. Abbott *et al.*, (LIGO–Virgo), *Search for tensor, vector, and scalar polarizations in the stochastic gravitational-wave background*, *Phys. Rev. Lett.* **120** (2018) 201102 Editors Suggestion.

[82] B. P. Abbott *et al.*, (LIGO–Virgo), *All-sky search for long-duration gravitational wave transients in the first Advanced LIGO observing run*, *Class. Quantum Grav.* **35** (2018) 065009.

[83] **C. Talbot** and E. Thrane, *Measuring the binary black hole mass spectrum with an astrophysically motivated parameterization*, *Astrophys. J.* **856** (2018) 173.

[84] **X.-J. Zhu**, E. Thrane, S. Osłowski, Y. Levin, and P. D. Lasky, *Inferring the population properties of binary neutron stars with gravitational-wave measurements of spin*, *Phys. Rev. D* **98** (2018) 043002.

[85] B. P. Abbott *et al.*, (LIGO–Virgo), *Search for post-merger gravitational waves from the remnant of the binary neutron star merger GW170817*, *Astrophys. J. Lett.* **851** (2017) L16.

[86] B. P. Abbott *et al.*, (LIGO–Virgo), *GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral*, *Phys. Rev. Lett.* **119** (2017) 161101.

[87] B. P. Abbott *et al.*, (LIGO–Virgo), *GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences*, *Phys. Rev. Lett.* **120** (2018) 091101 Editor's Suggestion.

[88] B. P. Abbott *et al.*, (LIGO–Virgo), *Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A*, *Astrophys. J. Lett.* **848** (2017) L13.

[89] B. P. Abbott *et al.*, (LIGO–Virgo), *A gravitational-wave standard siren measurement of the Hubble constant*, *Nature* **551** (2017) 85.

[90] E. Thrane, P. D. Lasky, and Y. Levin, *Challenges testing the no-hair theorem with gravitational waves*, *Phys. Rev. D* **96** (2017) 102004 ★.

[91] **C. Talbot** and E. Thrane, *Determining the population properties of spinning black holes*, *Phys. Rev. D* **96** (2017) 023012.

[92] T. Callister, A. S. Biscoveanu, N. Christensen, M. Isi, A. Matas, O. Minazzoli, T. Regimbau, M. Sakellariadou, J. Tasson, and E. Thrane, *Tests of general relativity with the stochastic gravitational-wave background*, *Phys. Rev. X* **7** (2017) 041058.

[93] B. P. Abbott *et al.*, (LIGO–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** (2017) 122003.

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[95] **L. O. McNeill**, E. Thrane, and P. D. Lasky, *Detecting gravitational wave memory without parent signals*, *Phys. Rev. Lett.* **118** (2017) 181103.

[96] C. Biwer *et al.*, *Validating gravitational-wave detections: The Advanced LIGO hardware injection system*, *Phys. Rev. D* **95** (2017) 062002.

[97] B. P. Abbott *et al.*, *Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO's First Observing Run*, *Phys. Rev. Lett.* **118** (2017) 121101.

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[102] T. Callister, **L. Sammut**, **S. Qiu**, I. Mandel, and E. Thrane, *The limits of astrophysics with gravitational wave backgrounds*, *Phys. Rev. X* **7** (2016) 031018.

[103] B. P. Abbott *et al.*, (LIGO–Virgo), *Observation of gravitational waves from a black hole merger*, *Phys. Rev. Lett.* **116** (2016) 061102.

[104] B. P. Abbott *et al.*, (LIGO–Virgo), *GW150914: Implications for the Stochastic Gravitational-Wave Background from Binary Black Holes*, *Phys. Rev. Lett.* **116** (2016) 131102 Editor's Suggestion.

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[123] D. Talukder, E. Thrane, S. Bose, and T. Regimbau, *Measuring neutron-star ellipticity with measurements of the stochastic gravitational-wave background*, *Phys. Rev. D* **89** (2014) 123008.

[124] D. Meacher, E. Thrane, and T. Regimbau, *Statistical properties of astrophysical gravitational-wave backgrounds*, *Phys. Rev. D* **89** (2014) 084063.

[125] E. Thrane and M. Coughlin, *Seedless clustering in all-sky searches for gravitational-wave transients*, *Phys. Rev. D* **89** (2014) 063012 ★.

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INVITED TALKS

Association of Asia Pacific Physical Societies — October 2021
Building better spin models for merging binary black holes — *Seoul, South Korea*

University of Melbourne — September 2021
Building better models for populations of merging binary black holes — *Melbourne, VIC*

University of Michigan — March 2021
Population Properties of Compact Objects from GWTC-2 — *Ann Arbor, MI*

University of New South Wales — December 2020
Compact objects in the Second LIGO-Virgo Gravitational-wave Transient Catalog — *Sydney, NSW*

University of Canterbury December 2020
Population Properties from the Second LIGO-Virgo Catalog *Canterbury, NZ*

LIGO-Virgo Webinar November 2020
Population Properties of Compact Objects from the Second LIGO-Virgo Catalog *YouTube*

University of Auckland October 2020
The population properties of binary black holes with Bayesian hierarchical modelling *Auckland, NZ*

CSIRO Astronomy & Space Science July 2020
Dispatches from the black hole mass gaps: recent results from LIGO-Virgo *Marsfield, NSW*

Gran Sasso Science Institute October 2019
The population properties of gravitational waves in the transient catalog *l'Aquila, Italy*

The Pietro Baracchi Conference October 2019
The population properties of gravitational waves in the transient catalog *Florence, Italy*

The University of Melbourne June 2019
From gold to gamma ray bursts: the science of GWTC-1 *Melbourne, VIC*

Swinburne Institute of Technology, Astrophysics Colloquium November 2018
Stellar astrophysics from ensembles of gravitational-wave events *Hawthorne, VIC*

Australasian Conference on General Relativity and Gravitation November 2017
GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral *Perth, WA*

Astronomy Data and Computing Services Workshop August 2017
Big Data Challenges in Gravitational-Wave Astronomy *Hawthorne, VIC*

University of Sydney, Physics Colloquium July 2017
After GW150914: gravitational-wave astronomy in the era of routine detection *Sydney, NSW*

AIP Conference December 2016
Detecting gravitational-wave memory from binary black holes *Brisbane, QLD*

University of Melbourne Physics Colloquium July 2016
Detecting gravitational-wave memory from binary black holes *Melbourne, VIC*

Astronomical Society of Australia July 2016
The first detection of gravitational waves and beyond *Sydney, NSW*

Origins of Mass 2016 June 2016
The first detection of gravitational waves and beyond *Odense, Denmark*

University of Western Australia Physics Seminar September 2015
Searching for gravitational waves with Advanced LIGO *Perth, WA*

Swinburne University of Technology Astro Seminar August 2015
Searching for gravitational waves with Advanced LIGO *Hawthorne, VIC*

University of Melbourne Physics Seminar July 2015
Searching for gravitational waves with Advanced LIGO *Melbourne, VIC*

Australia National University Seminar July 2015
MAGPI: Magnetically Assisted Gravitational-wave Pendulum Intorsion *Canberra, ACT*

Caltech/JPL CaJAGWR Seminar December 2014
Prospects for gravitational-wave background detection with Advanced LIGO/Virgo *Pasadena, CA*

Monash University Colloquium August 2014
Transforming physics teaching through the studio experience *Clayton, VIC*

University of Oregon Physics Colloquium March 2012
Warped spacetime, colliding stars, and the beginning of time *Eugene, OR*

MIT LIGO Seminar February 2012
From gamma-ray bursts to the Big Bang *Cambridge, MA*

University of Minnesota-Duluth Physics Colloquium October 2011
Gravitational-wave astronomy with LIGO *Duluth, MN*

APS April Meeting April 2011
Searches for a stochastic background of gravitational waves *Anaheim, CA*

University of Massachusetts Physics Colloquium October 2010
Progress on the search for the stochastic-gravitational-wave background *Amherst, MA*

Saint Olaf College Physics Colloquium February 2010
An introduction to gravitational-wave physics *Northfield, MN*

University of Wisconsin-Milwaukee Physics Seminar November 2009
Searching for intermediate-duration gravitational-wave transients with LIGO *Milwaukee, WI*

University of Minnesota-Duluth Physics Colloquium October 2008
Recent Results from Super-Kamiokande *Duluth, MN*

CONFERENCE & WORKSHOP PRESENTATIONS

ASA Annual Scientific Meeting July 2019
OzHF: A high-frequency gravitational-wave detector *Brisbane, QLD*

ACAMAR5 April 2019
Binary Black Hole Population Properties: Observing Run Two and Beyond *Healesville, VIC*

AIP Conference December 2018
Constraining GRB Jet Properties Using Coincident GW/EM Detections *Perth, WA*

Perimeter High Frequency Detector Workshop November 2018
Astrophysics and cosmology with gravitational-wave population inference *Waterloo, Ontario*

Australasian Conference on General Relativity and Gravitation November 2017
Astrophysical inference from ensembles of gravitational-wave transients *Perth, WA*

Australasian Conference on General Relativity and Gravitation December 2015
Hunting for gravitational waves with complicated signals *Clayton, VIC*

Gravitational Wave Physics and Astronomy Workshop June 2015
Detecting gravitational-wave backgrounds with advanced detectors *Osaka, Japan*

Optical Transient Searches in the ALIGO Era Workshop April 2015
Advanced LIGO and the prospects for GW triggers *Clayton, VIC*

Topics in Underground and Astroparticle Physics 13 September 2013
Stochastic Gravitational Waves in the Advanced Detector Era *Asilomar, CA*

GW Physics and Astronomy Workshop January 2011
STAMP: Stochastic Transient Analysis Multi-detector Pipeline *Milwaukee, WI*

APS "April" Meeting February 2010
Directional searches for persistent gravitational waves *Washington DC*

GW Data Analysis Workshop January 2010
Measuring the Stochastic Gravitational-Wave Background with LIGO-Virgo *Rome*

GW+HEN Workshop June 2009
Searching for Intermediate-Duration Gravitational-Wave Transients *Paris*

GW Data Analysis Workshop June 2009
Directional Searches for the stochastic gravitational-wave background with LIGO *San Juan*

LIGO-Virgo collaboration meetings 2009–
Plenary presentations at 11 meetings.

LEADERSHIP & SERVICE

Referee

The Astrophysical Journal, The Astrophysical Journal Letters, Physical Review D, Physical Review Applied, Physical Review Letters, Journal for Cosmology and Astroparticle Physics, Living Reviews in Relativity, Nature Astronomy

Reviewer

· The Australian Research Council, the Swiss National Science Foundation, Royal Society Te Apārangi, the US National Science Foundation

Scientific Advisory / Steering Committees

· IPTA Detection Committee (2021–), NCA MTR CapOp (2019), Astronomy Australia Ltd. (2018–2020), Gravitational wave Optical Transient Observatory (2016–)

LIGO Scientific Collaboration

· Co-Chair of Stochastic Data-Analysis Group (2011–2017), Review Chair for Burst Group (2017–2020), Editorial Board (2019–)

Scientific Organising Committees

· ASA 2019, GWPAW 2018

Diversity

· LVC Ally (2018–), OzGrav Diversity Committee (2017–)

PROFESSIONAL SOCIETIES

International Astronomical Union 2018–
Member

The Astronomical Society of Australia 2018–
Fellow

Australian Society for General Relativity and Gravitation 2016–
Lifetime Member

MEDIA

CNET 2021
Black holes devouring neutron stars have been detected for the first time

Astrophysical Journal Letters 2021
Focus on Gravitational-wave Astrophysics from the Second LIGO-Virgo Transient Catalog

phys.org 2021
Deciphering the lives of double neutron stars in radio and gravitational wave astronomy

The Independent 2021
Scientists may have found a black hole that could change our understanding of the Universe

Daily Mail 2021
Astronomers discover an elusive 'Goldilocks' black hole

Quanta Magazine 2021
Long-Missing Midsize Black Hole Flashes Into View

MIT News 2020
A technique to sift out the universes first gravitational waves

Cosmos 2020
Black hole mergers? 44 confirmed, and counting

CNET 2020
Astronomers probe black hole origins after 39 new cosmic collisions detected

Space Australia 2020
Massive neutron star a problem for evolutionary models

phys.org 2020
Scientists puzzle over massive, never-before-seen star system in the Milky Way

phys.org 2020
Future detectors to detect millions of black holes and the evolution of the universe

space.com 2019
The Universe Remembers Gravitational Waves—And We Can Find Them

The Conversation 2019
We've detected new gravitational waves, we just don't know where they come from (yet)

Catalyst 2019
Black hole hunters

Cosmos Magazine 2018
Gravitational waves: biggest black hole merger ever detected revealed

Lateral Magazine 2018
Creating an atlas of our Universe

The Age + related articles in Yahoo, Canberra Times, and other outlets 2018
Here's what two black holes smashing into each other sounds like

The 7:30 Report 2018
Australian scientists pioneer new way to hear black holes colliding

AstroBites 2018
More on GW170817: Black Hole Popcorn...

AstroBites 2017
Challenges with Testing the No-Hair Theorem

The 7:30 Report 2017
Scientists detect gravitational waves from collision of neutron stars

SBS 2017
Scientists in frenzy over colliding stars

The Guardian 2017
Neutron stars collision: Australian science reacts as it happened

ABC Radio Melbourne 2017
Guest appearance

The Australian 2017
Knowledge explodes in galaxy far, far away

The Australian 2017
Nobel Prize in Physics: Australians helped in gravitational waves research

The Conversation 2017
A new discovery of gravitational waves has black holes in a spin

New Scientist + related articles in Gizmodo, Yahoo, and other outlets 2017
LIGO could detect gravitational waves permanent space-time warp

ABC Radio, Beyond the Lab 2016
The Sound of the Universe

The Australian 2016
Monash's Chris Whittle play his part in scientific breakthrough

ABC News Breakfast 2016
Interview

Catalyst with Graham Phillips 2016
Gravitational waves

Lots Wife (Monash Student Newspaper) 2016
General Relativity and Gravitational Waves

The Sydney Morning Herald 2016
Gravitational waves: Australian scientists central role in their discovery

Australian Science 2016
Gravitational waves detected

The Australian 2016
Speculation rife that Einsteins greatest...

3AW radio Breakfast Show 2016
Interview

ABC 774 Red Symons Breakfast Show 2016
Interview

Channel Ten, The Project 2016
Cameo

The Conversation 2016
Australias part in the global effort to discover gravitational waves

The Science Show with Robyn Williams 2015
The search for gravitational waves

Catalyst with Graham Phillips 2015
Einsteins Extraordinary Universe

OUTREACH

Public Lecture, Monash University 2018
Frontiers in gravitational-wave astronomy *Clayton*

ANZAAS Science Week 2018
Black holes and neutron stars *Melbourne*

Scienceworks Museum 2018
Beyond Perception (consultant) *Melbourne*

VCE Physics Conference, La Trobe University 2018
Black holes and merging neutron stars *Bundoora*

John Monash Science School 2018
Black holes and merging neutron stars *Clayton*

AIP Nobel Prize Public Lecture, La Trobe University 2017
Frontiers in gravitational-wave astronomy *Bundoora*

Public lecture, Monash University 2017
Gravitational Waves from merging neutron stars *Clayton*

The Conversation 2017
An award with real gravity: how gravitational waves attracted a Nobel Prize

New Scientists Instant Expert: Relativity and Beyond 2017
The Hunt for Gravitational Waves *Sydney*

STEM Talks, Monash University 2016
The Detection of Gravitational Waves *Clayton*

Public lecture, Swinburne University of Technology (∼200 attendance) 2016
LIGO, Gravitational Waves, and the New Astronomy *Hawthorne*

High School Physics Day 2015, 2016

Public lecture, Monash University (>250 attendance) 2016
Observation of Gravitational Waves from a Binary Black Hole Merger *Clayton*

The Conversation 2015
The man behind the Nobel Prize in Physics on neutrinos and their mass

Cafe Science, Young Scientists of Australia 2015
Science presentation + Q&A *Melbourne*

Pasadena Engineering and Science Expo 2013
Outreach coordination and presentation *Pasadena*

Interactions in Understanding the Universe (I2U2) 2013
Outreach Coordinator *Minneapolis*

Minority Students in Engineering and Physics (MSEP) 2013
Tutor *Seattle*

TEACHING & EDUCATION

Monash University 2015–
Lectures *Clayton, VIC*

· PHS1011 (First-Year Physics): Unit Coordinator
· PHS1022 (First-Year Physics): Unit Coordinator
· PHS4200 (General Relativity)
· PHS5020 (Advanced General Relativity)

Monash University 2021–
Postgraduate Research Coordinator *Clayton, VIC*

Monash University 2015–2016
Education Head *Clayton, VIC*

Monash University 2015–
Supervision *Clayton, VIC*

· Research faculty
  • Dr Rory Smith 2017–
· Postdocs
  • Dr Grant Meadors 2018–2019
  • Dr Xingjiang Zhu 2017–2021
  • Dr Letizia Sammut 2015–2017
  • Dr Pablo Rosado 2016
· Postgraduate Students
  • Avi Vajpeyi 2019–
  • Shanika Galaudage 2019–
  • Isobel Romero-Shaw 2018–2021
  • Moritz Hübner 2018–2021
  • Francisco Hernandez 2017–2021
  • Colm Talbot 2016–2020
    – Winner: Vice-Chancellors Commendation for Thesis Excellence
    – Winner: Charlene Heisler Prize for the most outstanding astronomy PhD thesis in Australia
    – Winner: Robert Street Doctoral Prize
  • Boris Goncharov 2016–2020
  • Sylvia Biscoveanu (Fulbright, MIT) 2017–2018
· Year-Four Honours Students
  • Teagan Clarke 2021
  • Tushar Nagar 2021
  • Kris Walker 2021
  • Ethan Payne 2020
    – Honourable mention: Bok Prize for undergraduate astronomy research in Australia
  • Nick Farrow 2019
  • Marcus Lower 2017
  • Chris Whittle 2016

- Lucy McNeill 2016

· Undergraduate Students

- Carter Hills 2020
- Christian Adamcewicz 2020–2021
- Chandana Anand 2019
- Atul Divakarla (IREU from Florida) 2018
- Alex Kemp 2017
- Marcus Lower 2016
- William Campbell 2015–2017
- Chris Whittle 2015
- Shi Qiu 2015
- Tyson Jones 2015
- Sylvia Biscoveanu (IREU from Penn State) 2015

Caltech 2012–2014
Postdoctoral Mentor *Pasadena, CA*

· Thomas Callister (PhD, Caltech), Ryan Horton (BS, SURF from UMass), Gabriela Hernandez (BS, SURF from Georgia State), Jonathan Bayless (BS, Caltech), Duncan Meacher (PhD, visitor from Université Côte dAzur)

University of Minnesota 2008–2012
Postdoctoral Mentor *Minneapolis, MN*

· Michael Coughlin (BS, Carleton College), Jeff Mondloch (BS, Minnesota), Tanner Prestegard (PhD, Minnesota), Shivaraj Kandhasamy (PhD, Minnesota), Mandy Pihlaja (MS, Minnesota), Anthony Kremin (BS, Minnesota)

CGWAS Summer School (Caltech) 2013
Invited Lecturer *Pasadena, CA*