Ryan M. Magee

Spring 2023
Postdoctoral scholar – California Institute of Technology
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Education

The Pennsylvania State University 2021
Ph.D. in Physics, Advisor: Chad Hanna

Thesis: "Probing the Dark Universe with Gravitational Waves from Subsolar-mass Compact Objects"

Washington State University 2014
M.S. in Physics, Advisor: Sukanta Bose

Duke University 2012
B.S. in Physics

Fellowships and awards

W. Donald Miller Graduate Fellowship 2020
The Pennsylvania State University

David C. Duncan Graduate Fellowship in Physics 2020
The Pennsylvania State University

Edward A. and Rosemary A. Mebus Graduate Fellowship in Physics 2019
The Pennsylvania State University

Downsbrough Department Head's Chair in Physics Award 2018
The Pennsylvania State University

David C. Duncan Graduate Fellowship in Physics 2017
The Pennsylvania State University

Special Breakthrough Prize in Fundamental Physics 2016
Awarded to the LIGO Scientific Collaboration

Verne M. Willaman Distinguished Graduate Fellowship in Science 2016
The Pennsylvania State University

Claire and William Band Theoretical Physics Scholarship 2013
Washington State University

GAANN Fellow 2012
Washington State University

Invited talks and panels

CGCA Seminar — UW-Milwaukee
Exploring the multi-messenger universe with gravitational waves — February 24, 2023

Seminar — University of Utah
Exploring the multi-messenger universe with gravitational waves — February 7, 2023

GWPAW — Melbourne, Australia
Invited panelist — December 7, 2022

CCRG Lunch Seminar — RIT
Enabling multi-messenger astronomy with gravitational waves — April 8, 2022

CGCA Seminar — UW-Milwaukee (virtual)
Enabling multi-messenger astronomy with gravitational waves — March 4, 2022

Cosmology Lunchtime Seminar — University of Minnesota (virtual)
Early warning gravitational-wave alerts and expectations — September 27, 2021

Nikhef Gravity Seminar — Nikhef
Subsolar mass black holes as a probe of the dark matter — November 15, 2019

Gravitational Wave Probes of Fundamental Physics — Amsterdam, Netherlands
Panelist for discussion on primordial black holes — November 11, 2019

Conferences and workshops

APS April Meeting 2022 — New York, NY
Approximating the GW response on a continuous parameter space — April 12, 2022

Amaldi 2021 — Virtual
Prospects for early warning gravitational-wave alerts — July 20, 2021

APS April Meeting 2021 — Virtual
A novel signal consistency check for gravitational waves — April 19, 2021

APS April Meeting 2021 — Virtual
Early warning gravitational-wave alerts — April 17, 2021

APS April Meeting 2020 — Virtual
Early warning detection of gravitational waves from binary neutron stars — April 18, 2020

APS April Meeting 2019 — Denver, CO
Sub-threshold BNS search in Advanced LIGO's first observing run — April 15, 2019

Caltech LIGO Seminar — Caltech
Advanced LIGO searches for subsolar mass ultracompact objects — March 5, 2019

Physics and Astrophysics at the Extreme (PAX5) — Penn State
Deep GW searches for binary neutron stars in single and double IFO time — February 9, 2019

JSI-GWPAW — University of Maryland
Searches for SSM ultracompact objects with Advanced LIGO — December 1, 2018

Primordial vs. astrophysical origin of black holes — CERN
LIGO search for subsolar mass compact binaries in O1 data — May 17, 2018

APS April Meeting 2018 Columbus, OH
Disentangling the potential dark matter origin of LIGO's black holes April 15, 2018

Professional service and outreach

Chair of LVK All-Sky Searches 2022 -
Co-chair of detection oriented working group

Referee 2019 -
PRL, PRD, ApjL, MNRAS

Caltech-LIGO SURF 2021 -
Summer research mentor to underrepresented undergraduates

LIGO/CaJaGWr seminar series 2021 -
Co-organizer of two Caltech seminar series

Advanced LIGO science summaries 2018 -
The LIGO Scientific Collaboration

Envision: STEM Career Day for Girls 2018
The Pennsylvania State University University Park, PA

Dark Matter Day 2017
Organized an informational stand on dark matter in the student union Penn State

Teaching

The Pennsylvania State University
Teaching Assistant – Tasks: recitations, office hours, substitute lectures 2017 - 2018

The Washington State University
Teaching Assistant – Tasks: labs, exam grading 2012 - 2014

Duke University
Teaching Assistant – Tasks: labs, recitations, exam creation 2010 - 2012, 2015-2016

Mindspire Tutoring and Test Prep
Private Tutor – Tasks: SAT and ACT courses, private subject tutoring 2014 - 2016

Short author list publications

M. Saleem, et al. including **R. Magee** "Demonstration of Machine Learning-assisted real-time noise regression in gravitational wave detectors." *arXiv preprint arXiv: 2306.11366* (2023).

A. Ray, et al. including **R. Magee** "When to Point Your Telescopes: Gravitational Wave Trigger Classification for Real-Time Multi-Messenger Followup Observations." *arXiv preprint arXiv: 2306.07190* (2023).

L. Tsukada, et al. including **R. Magee** "Improved ranking statistics of the GstLAL inspiral search for compact binary coalescences." *arXiv preprint arXiv: 2305.06286* (2023).

B. Ewing, et al. including **R. Magee** "Performance of the low-latency GstLAL inspiral search towards LIGO, Virgo, and KAGRA's fourth observing run." *arXiv preprint arXiv: 2305.05625* (2023).

R. Magee, et al. "Realistic observing scenarios for the next decade of early warning detection of binary neutron stars." *The Astrophysical Journal* 935.2 (2022): 139

R. Magee, et al. "First Demonstration of Early Warning Gravitational-wave Alerts." *The Astrophysical Journal Letters* 910.2 (2021): L21.

H. Yu, R. Adhikari, and **R. Magee** et al. "Early warning of coalescing neutron-star and neutron-star-black-hole binaries from the nonstationary noise background using neural networks." *Physical Review D* 104.6 (2021) 062004.

D. Mukherjee and S. Caudill, and **R. Magee** et al. "The GstLAL template bank for spinning compact binary mergers in the second observation run of Advanced LIGO and Virgo." *Physical Review D* 103.8 (2021). 084047

K. Phukon et al. including **R. Magee** "The hunt for sub-solar primordial black holes in low mass ratio binaries is open." *arXiv preprint arXiv: 2105.11449* (2021).

S. Sachdev and **R. Magee**, et al. "An early warning system for electromagnetic follow-up of gravitational-wave events.." *The Astrophysical Journal Letters* 905.2 (2020): L25.

D. Singh, M. Ryan, and **R. Magee**, et al. "A gravitational-wave limit on the Chandrasekhar mass of dark matter." *Physical Review D* 104.4 (2020) 044015.

C. Hanna, et al. including **R. Magee** "Fast evaluation of multi-detector consistency for real-time gravitational wave searches." *Physical Review D* 101 (2020) no.2, 022003.

S. Kapadia et al. including **R. Magee** "A self-consistent method to estimate the rate of compact binary coalescences with a Poisson mixture model." *Classical and Quantum Gravity* 37, 045007 (2020).

C. Messick, et al. including **R. Magee** "Automating the Inclusion of Subthreshold Signal-to-Noise Ratios for Rapid Gravitational-Wave Localization." *arXiv preprint arXiv: 2011.02457* (2020).

P. Godwin et al. including **R. Magee** "Incorporation of Statistical Data Quality Information into the GstLAL Search Analysis." *arXiv preprint arXiv: 2010.15282* (2020).

K. Cannon, et al. including **R. Magee** "GstLAL: A software framework for gravitational wave discovery." *SoftwareX* 14 (2020) 100680.

C. Chan, et al. including **R. Magee** "Improving the background estimation technique in the GstLAL inspiral pipeline with the time-reversed template bank." *arXiv preprint arXiv: 2009.03025* (2020).

R. Magee, et al. "Sub-threshold binary neutron star search in Advanced LIGO's first observing run." *The Astrophysical Journal Letters* 878.1 (2019): L17.

S. Sachdev et al. including **R. Magee** "The GstLAL search analysis methods for compact binary mergers in Advanced LIGO's second and Advanced Virgo's first observing runs." *arXiv preprint arXiv: 1901.08580* (2019).

R. Magee, et al. "Methods for the detection of gravitational waves from subsolar mass ultracompact binaries." *Physical Review D* 98.10 (2018): 103024.

R. Magee and C. Hanna "Disentangling the potential dark matter origin of LIGO's black holes." *The Astrophysical Journal Letters* 845.2 (2017): L13.

Collaboration publications with major contributions

R. Abbott, et al."Search for subsolar-mass black hole binaries in the second part of Advanced LIGO's and Advanced Virgo's third observing run." *arXiv preprint: 2212.01477, accepted at MNRAS* (2022).

R. Abbott, et al."GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run." *arXiv preprint: 2111.03606, accepted at Physical Review X* (2021).

R. Abbott, et al."Search for subsolar-mass binaries in the first half of Advanced LIGO and Virgo's third observing run." *Physical Review Letters* 129.6 (2022): 061104.

R. Abbott, et al."GWTC-2.1: Deep Extended Catalog of Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run." *arXiv preprint: 2108.01045* (2021).

R. Abbott, et al."Observation of gravitational waves from two neutron star-black hole coalescences." *The Astrophysical Journal Letters*, 915.1 (2021) L5.

R. Abbott, et al."GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run." *Physical Review X* 11 (2020) 021053.

R. Abbott, et al."Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog." *The Astrophysical Journal Letters* 913.1 (2020) L17.

B. P. Abbott, et al."GW190814: Gravitational Waves from the Coalescence of a 23 Solar Mass Black Hole with a 2.6 Solar Mass Compact Object ." *The Astrophysical Journal Letters*, 896.2 (2020): L44

B. P. Abbott et al."Search for subsolar mass ultracompact binaries in Advanced LIGO's second observing run." *Physical Review Letters* 123.16 (2019): 161102.

B. P. Abbott et al."Search for subsolar mass ultracompact binaries in Advanced LIGO's first observing run." *Physical Review Letters* 121.23 (2018): 231103.

Collaboration publications with significant contributions

R. Abbott, et al. "The population of merging compact binaries inferred using gravitational waves through GWTC-3." *arXiv preprint: 2111.03634* (2021).

B. P. Abbott, et al. "Properties and Astrophysical Implications of the 150 $M_\odot$ Binary Black Hole Merger GW190521." *The Astrophysical Journal Letters*, 900 (2020): L13.

B. P. Abbott, et al. "GW190521: A Binary Black Hole Merger with a Total Mass of 150 $M_\odot$." *Physical Review Letters*, 125.10 (2020): 101102

B. P. Abbott, et al. "GW190425: Observation of a Compact Binary Coalescence with Total Mass $\sim$3.4 $M_\odot$." *The Astrophysical Journal Letters*, 892 (2020): L3.

B. P. Abbott, et al. "GWTC-1: a gravitational-wave transient catalog of compact binary mergers observed by LIGO and Virgo during the first and second observing runs." *Physical Review X* 9.3 (2019): 031040.

A complete list of 100+ publications is available via ADS

Press

Can cosmic collisions be predicted before they happen? March 10, 2023
Caltech News Author: Whitney Clavin

Software Engineering in Physics Research November 2, 2022
Podcast for Software Engineering Radio Host: Jeff Doolittle

Black holes can gobble up neutron stars whole July 1, 2021
Interview for Popular Science Author: Charlie Wood