Michael J. Zevin || *Curriculum Vitae*

University of Chicago/Enrico Fermi Institute — 5640 S Ellis Ave — Chicago, IL 60637

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NHFP postdoctoral fellow with research interests in gravitational waves, compact objects, and stellar evolution.

Education

Academic Qualifications

Northwestern University — **Ph.D.**, *August 2020*
Evanston, IL — **M.Sc.**, *December 2016*

Program:	Physics and Astronomy
Certificates:	Integrated Data Science
Thesis:	Unveiling the Lives and Deaths of Stars through Compact Object Mergers
Advisor:	Vicky Kalogera

University of Illinois — **B.S.**, *May 2012*
Champaign, IL

Majors:	Astronomy, Physics
Minor:	Music Performance

Fellowships

- ▷ **NASA Hubble Fellowship Program: Hubble postdoctoral fellow** *2020–present*
- ▷ **Enrico Fermi Postdoctoral Fellow** *expected: 2023*
- ▷ **NSF IDEAS Fellowship** *2016–2020*
- ▷ **Illinois Space Grant Consortium Fellowship** *2017–2020*
- ▷ **NSF GK12 Fellowship** *2017–2018*
- ▷ **Oxford Centre for Cosmological Studies Balzan Fellowship**[1] *2018*
- ▷ **Kavli Summer Fellowship**[2] *2017*

Publications

First Author & Chaired Papers (with links)

One Channel to Rule Them All? Constraining the Origins of Binary Black Holes using Multiple Formation Pathways — **ApJL** *2020*
M. Zevin, S. Bavera, C. Berry, V. Kalogera, T. Fragos, P. Marchant, C. Rodriguez, F. Antonini, D. Holz, C. Pankow
The Astrophysical Journal Letters (submitted)

Exploring the Lower Mass Gap and Unequal Mass Regime in Compact Binary Evolution — **ApJL** *2020*
M. Zevin, M. Spera, C. Berry, V. Kalogera
The Astrophysical Journal Letters **899**, L1

You Can't Always Get What You Want: The Impact of Prior Assumptions on Interpreting GW190412 — **ApJL** *2020*
M. Zevin, C. Berry, S. Coughlin, K. Chatziioannou, S. Vitale
The Astrophysical Journal Letters **899**, L17

Forward Modeling of Double Neutron Stars: Insights from Highly-Offset Short Gamma-ray Bursts — **ApJ** *2019*
M. Zevin, L. Kelley, A. Nugent, W. Fong, C. Berry, V. Kalogera
The Astrophysical Journal (in press)

[1] Research Advisor: Dr. Chris Lintott (New College, University of Oxford)
[2] Research Advisor: Dr. Enrico Ramirez-Ruiz (University of California Santa Cruz)

arXiv: 1910.03598

Can Neutron-Star Mergers Explain the r-process Enrichment in Globular Clusters? **ApJ**
M. Zevin, K. Kremer, D. M. Siegel, S. Coughlin, B. T.-H. Tsang, C. P. L. Berry, V. Kalogera *2019*
The Astrophysical Journal **886**, 1

Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters **ApJ**
M. Zevin, J. Samsing, C. L. Rodriguez, C. J. Haster, E. Ramirez-Ruiz *2019*
The Astrophysical Journal **871**, 91
– Covered by *AAS Nova*

On the Progenitor of Binary Neutron Star Merger GW170817 **ApJL**
The LIGO Scientific Collaboration and Virgo Collaboration[3] *2017*
The Astrophysical Journal Letters **850**, L40

Constraining Formation Models of Binary Black Holes with Gravitational-Wave Observations **ApJ**
M. Zevin, C. Pankow, C. Rodriguez, L. Sampson, E. Chase, V. Kalogera, F. Rasio *2017*
The Astrophysical Journal **846**, 82

Gravity Spy: Integrating Advanced LIGO Detector Characterization, Machine Learning, and Citizen Science **CQG** *2017*
M. Zevin, S. Coughlin, S. Bahaadini, E. Besler, N. Rohani, S. Allen, M. Cabero, K. Crowston, A. Katsaggelos, S. Larson, T. Lee, C. Lintott, T. Littenberg, A. Lundgren, C. Østerlund, J. Smith, L. Trouille, V. Kalogera
Classical and Quantum Gravity **34**, 064003
– Covered by *AAS Press*

Highlighted Contributed Papers

GW190412: Observation of a Binary-Black-Hole Coalescence with Asymmetric Masses **PRD**
The LIGO Scientific Collaboration and Virgo Collaboration[4] *2020*
Physical Review D **102**, 043015

COSMIC: Open-Source Binary Population Synthesis **ApJ**
K. Breivik, S. Coughlin, M. Zevin, C Rodriguez, K. Kremer, C. Ye, J. Andrews, M. Kurkowski, M. Digman, S. Larson, F. Rasio *2019*
The Astrophysical Journal **898**, 71

Black Holes: The Next Generation **PRD**
C. Rodriguez, M. Zevin, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. A. Rasio, C. S. Ye *2019*
Physical Review D **100**, 043027

Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO **ApJL**
C. Rodriguez, M. Zevin, C. Pankow, V. Kalogera, F. A. Rasio *2016*
The Astrophysical Journal Letters **832**, L2

Contributed Papers (with links)

Evidence for Hierarchical Black Hole Mergers in the Second LIGO–Virgo Gravitational-Wave Catalog
C. Kimball, C. Talbot, C. Berry, M. Zevin, E. Thrane, V. Kalogera, R. Buscicchio, M. Carney, T. Dent, H. Middleton, E. Payne, J. Veitch, D. Williams *2020*
The Astrophysical Journal Letters (submitted)
arXiv: 2011.05332

The Impact of Mass-Transfer Physics on the Observable Properties of Field Binary Black Hole Populations
S. Bavera, T. Fragos, M. Zevin, C. Berry, P. Marchant, J. Andrews, S. Coughlin, A. Dotter, K. Kovlakas, D. Misra, J. Serra-Perez, Y. Qin, K. Rocha, J. Romn-Garza, N. Tran, E. Zapartas *2020*
Monthly Notices of the Royal Astronomical Society (submitted)
arXiv: 2010.16333

Black hole genealogy: Identifying hierarchical mergers with gravitational waves

[3] *M. Zevin*: Chair of paper-writing team and analysis lead
[4] *M. Zevin*: Paper-writing team, populations and astrophysical implications lead

*C. Kimball, C. Talbot, C. Berry, M. Carney, **M. Zevin**, E. Thrane, V. Kalogera* *2020*
The Astrophysical Journal (submitted)
arXiv: 1911.00903

Black Hole Mergers from Hierarchical Triples in Dense Star Clusters **ApJ**
M. Martinez, G. Fragione, K. Kremer, S. Chatterjee, C. L. Rodriguez, J. Samsing, C. S. Ye, N. Weatherford, *2020*
__M. Zevin__, S. Naoz, F. A. Rasio
The Astrophysical Journal **903**, *67*

Teaching Citizen Scientists to Categorize Glitches using Machine Learning Guided Training **CHB**
C. Jackson, C. Østerlund, K. Crowston, M. Harandi, S. Allen, S. Bahaadini, S. Coughlin, *2019*
V. Kalogera, A. Katsaggelos, S. Larson, N. Rohani, J. Smith, L. Trouille, __M. Zevin__
Computers in Human Behavior (accepted)

The Missing Link in Gravitational-Wave Astronomy: Discoveries waiting in the decihertz range **ESA WP**
M. Arca Sedda, C. Berry, K. Jani, P. Amaro-Seoane, P. Auclair, J. Baird, T. Baker, E. Berti, *2019*
K. Breivik, C. Caprini, X. Chen, D. Doneva, J. Ezquiaga, S. Ford, M. Katz, S. Kolkowitz, B. McKernan,
G. Mueller, G. Nardini, I. Pikovski, S. Rajendran, A. Sesana, L. Shao, N. Tamanini, N. Warburton,
H. Witek, K. Wong, __M. Zevin__
ESA's Voyage 2050 White Paper

Knowledge Tracing to Model Learning in Online Citizen Science Projects **IEEE TLT**
K. Crowston, C. Østerlund, T. Lee, C. Jackson, M. Harandi, S. Allen, S. Bahaadini, S. Coughlin, *2019*
A. Katsaggelos, S. Larson, N. Rohani, J. Smith, L. Trouille, __M. Zevin__
IEEE Transactions on Learning Technologies (accepted)

Classifying the Unknown: Discovering Novel Gravitational-Wave Detector Glitches using Similarity Learning **PRD**
2019
S. Coughlin, S. Bahaadini, N. Rohani, __M. Zevin__, O. Patane, M. Harandi, C. Jackson, V. Noroozi,
S. Allen, J. Areeda, M. Coughlin, P. Ruiz, C. P. L. Berry, K. Crowston, A. K. Katsaggelos,
A. Lundgren, C. Østerlund, J. R. Smith, L. Trouille, V. Kalogera
Physical Review D **99**, *082002*

Post-Newtonian Dynamics in Dense Star Clusters: Binary Black Holes in the LISA Band **PRD**
K. Kremer, C. L. Rodriguez, P. Amaro-Seoane, K. Breivik, S. Chatterjee, M. L. Katz, *2019*
S. Larson, F. A. Rasio, J. Samsing, C. S. Ye, __M. Zevin__
Physical Review D **99**, *063003*

Post-Newtonian Dynamics in Dense Star Clusters: Formation, Masses, and Merger Rates of Highly-Eccentric Black Hole Binaries **PRD**
2018
C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. A. Rasio, J. Samsing, C. S. Ye, __M. Zevin__
Physical Review D **98**, *123005*

DIRECT: Deep Discriminative Embedding for Clustering of LIGO Data **ICIP**
S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, __M. Zevin__, V. Kalogera, A. K. Katsaggelos *2018*
25th IEEE International Conference on Image Processing Proceedings

Machine Learning for Gravity Spy: Glitch Classification and Dataset **ISJ**
S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, __M. Zevin__, J. R. Smith, V. Kalogera, *2018*
A. K. Katsaggelos
Information Sciences Journal **444**, *172*

Improvements in Gravitational-wave Sky Localization with Expanded Networks of Interferometers **ApJL**
2018
C. Pankow, E. A. Chase, S. Coughlin, __M. Zevin__, V. Kalogera
The Astrophysical Journal Letters **854**, *L25*

Deep Multi-view Models for Glitch Classification **ICASSP**
S. Bahaadini, N. Rohani, S. Coughlin, __M. Zevin__, V. Kalogera, A. K. Katsaggelos *2018*
IEEE International Conference on Acoustics, Speech, and Signal Processing Proceedings

Incorporating Current Research into Formal Higher Education Settings using Astrobites **AJP**
N. E. Sanders, S. Kohler, C. Faesi, A. Villar, __M. Zevin__ *2017*
American Journal of Physics **85**, *741*

Astrophysical Prior Information and Gravitational-Wave Parameter Estimation **APJ**
C. Pankow, L. Sampson, L. Perri, E. A. Chase, S. Coughlin, M. Zevin, V. Kalogera *2017*
The Astrophysical Journal **834**, *154*

Collaboration Papers (as part of the LIGO Scientific Collaboration, 2015–Present) . . . . . .

– *Search for Gravitational Waves Associated with Gamma-Ray Bursts Detected by Fermi and Swift During the LIGO-Virgo Run O3a*
– *Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog*
– *Tests of General Relativity with Binary Black Holes from the second LIGO-Virgo Gravitational-Wave Transient Catalog*
– *GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run*
– *Gravitational-wave Constraints on the Equatorial Ellipticity of Millisecond Pulsars*
– *GW190521: A Binary Black Hole Merger with a Total Mass of 150 $M_\odot$*
– *Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA*
– *Properties and Astrophysical Implications of the 150 M Binary Black Hole Merger GW190521*
– *GW190814: Gravitational Waves from the Coalescence of a 23 Solar Mass Black Hole with a 2.6 Solar Mass Compact Object*
– *Optically targeted search for gravitational waves emitted by core-collapse supernovae during the first and second observing runs of advanced LIGO and advanced Virgo*
– *GW190412: Observation of a binary-black-hole coalescence with asymmetric masses*[5]
– *A Joint Fermi-GBM and LIGO/Virgo Analysis of Compact Binary Mergers from the First and Second Gravitational-wave Observing Runs*
– *A guide to LIGO-Virgo detector noise and extraction of transient gravitational-wave signals*
– *Model comparison from LIGO-Virgo data on GW170817's binary components and consequences for the merger remnant*
– *Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model*
– *Open data from the first and second observing runs of Advanced LIGO and Advanced Virgo*
– *Tests of general relativity with the binary black hole signals from the LIGO-Virgo catalog GWTC-1*
– *Search for Gravitational-wave Signals Associated with Gamma-Ray Bursts during the Second Observing Run of Advanced LIGO and Advanced Virgo*
– *Search for Subsolar Mass Ultracompact Binaries in Advanced LIGO's Second Observing Run*
– *Search for Eccentric Binary Black Hole Mergers with Advanced LIGO and Advanced Virgo during Their First and Second Observing Runs*
– *Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network*[6]
– *Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs*
– *Search for the isotropic stochastic background using data from Advanced LIGO's second observing run*
– *Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo*[7]
– *A gravitational-wave measurement of the Hubble constant following the second observing run of Advanced LIGO and Virgo*
– *GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs*
– *Tests of General Relativity with GW170817*
– *All-sky search for short gravitational-wave bursts in the second Advanced LIGO and Advanced Virgo run*
– *All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data*
– *Searches for Gravitational Waves from Known Pulsars at Two Harmonics in 2015–2017 LIGO Data*
– *Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run*
– *All-sky search for long-duration gravitational-wave transients in the second Advanced LIGO observing run*

[5] ***M. Zevin***: Paper-writing team, populations and astrophysical implications lead, education and public outreach liaison
[6] ***M. Zevin***: Parameter estimation lead for highest-significance IMBH trigger
[7] ***M. Zevin***: Education and public outreach liaison

– *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*
– *Low-latency Gravitational-wave Alerts for Multimessenger Astronomy during the Second Advanced LIGO and Virgo Observing Run*
– *Search for Gravitational Waves from a Long-lived Remnant of the Binary Neutron Star Merger GW170817*
– *Searches for Continuous Gravitational Waves from 15 Supernova Remnants and Fomalhaut b with Advanced LIGO*
– *Search for Transient Gravitational-wave Signals Associated with Magnetar Bursts during Advanced LIGOs Second Observing Run*
– *Constraining the p-Mode–g-Mode Tidal Instability with GW170817*
– *Properties of the Binary Neutron Star Merger GW170817*
– *A Fermi Gamma-Ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-wave Candidates in Advanced LIGO's First Observing Run*
– *Search for Multimessenger Sources of Gravitational Waves and High-energy Neutrinos with Advanced LIGO during Its First Observing Run, ANTARES, and IceCube*
– *Search for Subsolar-Mass Ultracompact Binaries in Advanced LIGO's First Observing Run*
– *GW170817: Measurements of Neutron Star Radii and Equation of State*
– *Search for Tensor, Vector, and Scalar Polarizations in the Stochastic Gravitational-Wave Background*
– *Full band all-sky search for periodic gravitational waves in the O1 LIGO data*
– *Constraints on cosmic strings using data from the first Advanced LIGO observing run*
– *Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA*
– *GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences*
– *Effects of data quality vetoes on a search for compact binary coalescences in Advanced LIGOs first observing run*
– *All-sky search for long-duration gravitational wave transients in the first Advanced LIGO observing run*
– *First Search for Nontensorial Gravitational Waves from Known Pulsars*
– *First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data*
– *First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data*
– *GW170608: Observation of a 19 Solar-mass Binary Black Hole Coalescence*
– *Search for Post-merger Gravitational Waves from the Remnant of the Binary Neutron Star Merger GW170817*
– *Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817*
– *Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory*
– *On the Progenitor of Binary Neutron Star Merger GW170817*[8]
– *A gravitational-wave standard siren measurement of the Hubble constant*
– *Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A*
– *Multi-messenger Observations of a Binary Neutron Star Merger*
– *GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral*[9]
– *GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence*
– *All-sky search for periodic gravitational waves in the O1 LIGO data*
– *Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-based Cross-correlation Search in Advanced LIGO Data*
– *Search for high-energy neutrinos from gravitational wave event GW151226 and candidate LVT151012 with ANTARES and IceCube*
– *Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO*
– *GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2*
– *Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model*
– *Search for Gravitational Waves Associated with Gamma-Ray Bursts during the First Advanced LIGO Observing Run and Implications for the Origin of GRB 150906B*
– *Effects of waveform model systematics on the interpretation of GW150914*
– *Search for continuous gravitational waves from neutron stars in globular cluster NGC 6544*
– *First Search for Gravitational Waves from Known Pulsars with Advanced LIGO*
– *Directional Limits on Persistent Gravitational Waves from Advanced LIGO's First Observing Run*
– *Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO's First Observing Run*
– *Calibration of the Advanced LIGO detectors for the discovery of the binary black-hole merger GW150914*

[8] ***M. Zevin***: Paper-writing chair and analysis lead
[9] ***M. Zevin***: Education and public outreach liaison

– *All-sky search for short gravitational-wave bursts in the first Advanced LIGO run*
– *Exploring the sensitivity of next generation gravitational wave detectors*
– *The basic physics of the binary black hole merger GW150914*
– *Supplement: The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914 (2016, ApJL, 833, L1)*
– *The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914*
– *Upper Limits on the Rates of Binary Neutron Star and Neutron Star-Black Hole Mergers from Advanced LIGOs First Observing Run*
– *Results of the deepest all-sky survey for continuous gravitational waves on LIGO S6 data running on the Einstein@Home volunteer distributed computing project*
– *First targeted search for gravitational-wave bursts from core-collapse supernovae in data of first-generation laser interferometer detectors*
– *Binary Black Hole Mergers in the First Advanced LIGO Observing Run*
– *Improved Analysis of GW150914 Using a Fully Spin-Precessing Waveform Model*
– *Directly comparing GW150914 with numerical solutions of Einstein's equations for binary black hole coalescence*
– *Comprehensive all-sky search for periodic gravitational waves in the sixth science run LIGO data*
– *Characterization of transient noise in Advanced LIGO relevant to gravitational wave signal GW150914*
– *Supplement: Localization and Broadband Follow-up of the Gravitational-wave Transient GW150914 (2016, ApJL, 826, L13)*
– *Localization and Broadband Follow-up of the Gravitational-wave Transient GW150914*
– *GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence*
– *Properties of the Binary Black Hole Merger GW150914*
– *Tests of General Relativity with GW150914*
– *High-energy neutrino follow-up search of gravitational wave event GW150914 with ANTARES and IceCube*
– *Search for transient gravitational waves in coincidence with short-duration radio transients during 2007-2013*
– *Observing gravitational-wave transient GW150914 with minimal assumptions*
– *GW150914: First results from the search for binary black hole coalescence with Advanced LIGO*
– *GW150914: The Advanced LIGO Detectors in the Era of First Discoveries*
– *GW150914: Implications for the Stochastic Gravitational-Wave Background from Binary Black Holes*
– *All-sky search for long-duration gravitational wave transients with initial LIGO*
– *Astrophysical Implications of the Binary Black-hole Merger GW150914*
– *Observation of Gravitational Waves from a Binary Black Hole Merger*
– *Prospects for Observing and Localizing Gravitational-Wave Transients with Advanced LIGO and Advanced Virgo*

Presentations

Invited Talks

Zooniverse Transient Workshop — *Virtual*
Gravity Spy: Leveling Up & Training Volunteers using Machine Learning — *November 2020*

CE Explorer Panel — *Virtual*
Binary Formation, panelist — *October 2020*

Perimeter Institute Strong Gravity Seminar — *Waterloo, ON*
Deciphering the Landscape of Compact Binary Formation Channels — *December 2019*

AEI Seminar — *Postdam, DE*
Deciphering the Landscape of Compact Binary Formation Channels — *December 2019*

Caltech TAPIR Seminar — *Pasadena, CA*
Deciphering the Landscape of Compact Binary Formation Channels — *November 2019*

UCLA Lunch Talk — *Los Angeles, CA*
Deciphering the Landscape of Compact Binary Formation Channels — *November 2019*

UCSC FLASH Seminar — *Santa Cruz, CA*
Deciphering the Landscape of Compact Binary Formation Channels — *November 2019*

UCSB Astro Lunch — *Santa Barbara, CA*

Deciphering the Landscape of Binary Black Hole Formation Channels — *November 2019*

Colombia Astronomy Seminar — *New York, NY*
Getting the boot: Lonely GRBs, enigmatic r-process, and the birth of neutron stars — *October 2019*

MIT GRITTS Seminar — *Cambridge, MA*
Unveiling the Lives and Deaths of Stars through Compact Object Mergers — *October 2019*

CfA High Energy Astrophysics Seminar — *Cambridge, MA*
Deciphering the Landscape of Binary Black Hole Formation Channels — *October 2019*

CGCA Seminar — *Milwaukee, WI*
Unveiling the Lives and Deaths of Stars through Compact Object Mergers — *March 2019*

IGC Seminar — *Portsmouth, UK*
From the Detected to the Detectors: Using Gravitational Waves to Enable Insights from the Stellar Graveyard & the Next Generation of Citizen Science — *March 2018*

SPI-MAX Seminar — *Oxford, UK*
From the Detected to the Detectors: Using Gravitational Waves to Enable Insights from the Stellar Graveyard & the Next Generation of Citizen Science — *February 2018*

Contributed Talks & Posters

Aspen Winter Conference (Talk) — *Aspen, CO*
Eccentric Black Hole Mergers in Dense Star Clusters: Post-Newtonian Effects & Higher Multiplicity Encounters — *February 2019*

AAS 233 (Talk) — *Seattle, WA*
Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters — *January 2019*

NSF Research Traineeship Annual Meeting (Poster) — *Washington, DC*
Gravity Spy: Integrating Gravitational-Wave Astrophysics, Machine Learning, and Citizen Sciences — *September 2018*

MODEST-18 (Talk) — *Santorini, Greece*
The Role of Binary-Binary Interactions in Inducing Eccentric Black Hole Mergers — *June 2018*

APS April Meeting (Talk) — *Columbus, OH*
On the Progenitor of Binary Neutron Star Merger GW170817 — *April 2018*

Detecting the Unexpected: Discovery in the Era of Astronomically Big Data (Talk) — *Baltimore, MD*
The Future of Citizen Science: Coupling Crowdsourcing and Machine Learning — *March 2017*

APS April Meeting (Talk) — *Washington, DC*
Discriminating Formation Channels of Binary Black Hole Systems with Advanced LIGO — *January 2017*

AAS 229 (Talk) — *Grapevine, TX*
Discriminating Formation Channels of Binary Black Hole Systems with Advanced LIGO — *January 2017*

AAS 229 (Workshop & Poster) — *Grapevine, TX*
Astrobites: Engaging Undergraduate Science Majors with Current Astrophysical Research — *January 2017*

AAS 228 (Talk) — *San Diego, CA*
Gravity Spy: Integrating aLIGO detector characterization, machine learning, and citizen science — *June 2016*

Northwestern Computational Research Exposition (Poster) — *Evanston, IL*
Integrating aLIGO detector characterization, machine learning, and citizen science — *April 2016*
– *Awarded first prize in poster competition*

Midwest Relativity Meeting (Talk) — *Evanston, IL*
LIGO glitch classification through the combination of machine learning and citizen science — *September 2015*

Outreach & Public Engagement

Science Communication

Astrobites — **Blog**
Author, Administrator, & Leadership Team — *2014–Present*
– *Astronomy blog partnered with the AAS, provides daily summaries of recent astronomy research articles*
– *Initiated the "Beyond" series, which covers topics on career advice, graduate school applications, and diversity, equity, and inclusivity in astronomy*

ComSciCon — **Workshop**
Organizer, Attendee — *2017–Present*
– *National graduate-student run science communication workshop for graduate students in STEM fields*

Astronomy on Tap — **Public Event**
Co-founder, organizer, host, speaker — *2015–Present*
– *Co-founded the Chicago branch of Astronomy on Tap, which hosts astronomy talks and space-based trivia at bars and breweries in the Chicago-land area*

Rapid Fire Research — **Departmental Event**
Founder, Chair — *2016–Present*
– *Annual research presentation event for graduate and undergraduate students in Northwestern Department of Physics and Astronomy*

Machine Learning Meetups — **Public Event**
Organizer, Host — *2016–2018*
– *Quarterly interdisciplinary colloquia on data science and machine learning topics*

Chicagoland Science Penpals — **Event**
Participant — *2017*
– *Correspondence with students in Chicago public schools about scientific research and science as a profession, using handwritten letters*

Public Talks & Lectures

Astronomer Conversations — **Lecture Series**
Adler Planetarium, Space Visualization Laboratory — *2014–Present*
– *Monthly public presentations at the Adler Planetarium for museum guests*

Astronomer Evenings — **Lecture Series**
Northwestern University, Dearborn Observatory — *2016–Present*
– *Presentations during public observing hours at the Dearborn Observatory*

UBS Investment Banking: Gravity Spy and LIGO — **Invited Speaker**
Virtual — *September 2020*

Chipping Norton Amateur Astronomy Group — **Keynote Lecture**
Chipping Norton, UK — *February 2018*

Take Our Children to Work Day — **Lecture**
Northwestern University — *April 2016, 2018*

Haven Midde School — **Invited Speaker**
Evanston, IL — *April 2017, 2018*

Chicago Astronomical Society — **Keynote Lecture**
Adler Planetarium — *May 2017*

Avery Coonley School — **Invited Speaker**
Downers Grove, IL — *May 2017*

Seven Minutes of Science: An Interdisciplinary Symposium — **Public Talk**
Northwestern University — *April 2017*

Highcrest Elementary — **Invited Speaker**
Wilmette, IL — *March 2017*

Einstein Evenings — **Lecture Series**
Northwestern University, Dearborn Observatory — *2015–2016*

– *Monthly presentations during observing hours on LIGO discoveries in celebration of the 100th anniversary of General Relativity*

Nettlehorst Elementary — **Invited Speaker**
Chicago, IL — *February 2016*

Publications

Astrobites — **Blog**
*Authored over 20 blog posts on current research in astrophysics (**Link**)* — *2014–Present*

LIGO Science Summary — **Article**
*Companion science summary to the LIGO-Virgo O2 Populations paper (**Link**)* — *November 2018*
*Companion science summary to the GW170817 Detection paper (**Link**)* — *October 2017*

LIGO Magazine — **Magazine Article**
*The Gravity Spy Project - Machine Learning and Citizen Science (**Link**)* — *March 2017*

Helix Magazine — **Magazine Article**
*The Legacy of Scientific Discovery (**Link**)* — *March 2017*

Teaching & Work Experience

Northwestern University — **Lecture/TA**
Introduction to Astronomy, Stellar Astrophysics, Data-Driven Research in Astronomy — *2015–Present*
– *Guest lectured, developed assignments, graded, and ran telescope observing sessions*

GK12 Fellowship — **Teaching**
Reach for the Stars; Evanston, IL — *2017–2018*
– *Co-taught astronomy classes at Evanston Township High School*
– *Developed curriculum, coding-based lessons, and visualizations for high-school students*

Kids Science Labs — **Teaching**
Lead Teacher; Chicago, IL — *2013–2015*
– *Taught classes of 3-12 year old students in hands-on, experiential science classes*
– *Designed curriculum for science summer camps*

Adler Planetarium — **Teaching**
Science Leadership Corps Instructor, Mission Specialist; Chicago, IL — *2012–2014*
– *Designed educational programming*
– *Facilitated exhibits, performed experiments, and gave astronomy talks to the public*
– *Led under-represented students in designing experiments for high-altitude balloon launches*

Students Mentored

Michael Kurkowski — **Undergraduate**
Pair Instability Supernova Prescriptions in Binary Population Synthesis; CIERA REU Student — *2019*

Jared Machtinger — **High School**
Population properties of binary black holes detected by LIGO; CIERA Summer Student — *2019*

Danai Avdela — **High School**
Population properties of binary black holes detected by LIGO; CIERA Summer Student — *2019*

Isaac Rivera — **Undergraduate**
Offset distributions of short gamma-ray bursts; CIERA REU Student — *2018*

Grace Kern — **High School**
Optimization of Gravity Spy image retirement; CIERA Summer Student — *2018*

Hannah Stein — **High School**
Optimization of Gravity Spy image retirement; CIERA Summer Student — *2018*

Yuqi Yun — **Undergraduate**

Gaussian Process regression of black hole mass distributions; CIERA REU Student *2016*

Sophie Haight **High School**
Gaussian Process regression of binary stellar evolution sequences; CIERA Summer Student *2016*

Awards & Honors

- **Avery Coonley School, Graduate Keynote Speaker** *June 2018*
- **American Astronomical Society, Media Intern** *June 2016*
- **Breakthrough Prize in Fundamental Physics** *(as part of the LIGO-Virgo Collaboration)* *May 2016*
- **Gruber Cosmology Prize** *(as part of the LIGO-Virgo Collaboration)* *May 2016*
- **National Science Foundation Graduate Research Fellowship** *(honorable mention)* *April 2016*
- **First Place, Poster Competition** *(Computational Research Day, Northwestern University)* *April 2016*
- **High Distinction in Physics** *(University of Illinois Urbana-Champaign)* *May 2012*

Affiliations & Leadership Positions

- **Astrobites:** *Administrator, Author* *2014–Present*
- **ComSciCon National:** *Organizer* *2017–Present*
- **LIGO Scientific Collaboration:** *Member* *2015–Present*
- **American Astronomical Society:** *Junior Member* *2016–Present*
- **American Physical Society:** *Member* *2016–Present*
- **CIERA Compact Objects Coffee:** *Founder, chair* *2018–Present*
- **Chicago Metropolitan Symphony Orchestra:** *Double Bassist* *2014–Present*
- **Physics and Astronomy Graduate Student Council:** *Quality of Life Chair* *2016–2018*
- **Rapid Fire Research:** *Founder, chair* *2016–2018*

Service Work

Peer Reviewer for: *2017–Present*
– *The Astrophysical Journal*
– *The Astrophysical Journal Letters*
– *Astronomy and Astrophysics*
– *Monthly Notices of the Royal Astronomical Society*
– *Physical Review D*
– *Physical Review Letters*