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.**, *September 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*
- ▷ **Zhengtong/Enrico Fermi Postdoctoral Fellow** *expected: 2023*
- ▷ **KICP 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)

Implications of Eccentric Observations on Binary Black Hole Formation Channels
M. Zevin, I. Romero-Shaw, K. Kremer, E. Thrane, P. Lasky *2021*
arxiv: 2106.09042

One Channel to Rule Them All? Constraining the Origins of Binary Black Holes using Multiple Formation Pathways **ApJ** *2021*
M. Zevin, S. Bavera, C. Berry, V. Kalogera, T. Fragos, P. Marchant, C. Rodriguez, F. Antonini, D. Holz, C. Pankow
The Astrophysical Journal **910**, 152

Forward Modeling of Double Neutron Stars: Insights from Highly-Offset Short Gamma-ray Bursts **ApJ**
M. Zevin, L. Kelley, A. Nugent, W. Fong, C. Berry, V. Kalogera *2020*
The Astrophysical Journal **904**, 190

Exploring the Lower Mass Gap and Unequal Mass Regime in Compact Binary Evolution **ApJL**

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

M. Zevin, M. Spera, C. Berry, V. Kalogera *2020*
The Astrophysical Journal Letters **899**, L1

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

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

Approximations to the spin of close Black-hole–Wolf-Rayet binaries
S. Bavera, M. Zevin, T. Fragos *2021*
Research Notes of the American Astronomical Society (submitted)
arXiv: 2105.09077

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*

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

The Astrophysical Journal Letters (submitted)
arXiv: 2011.05332

The Impact of Mass-Transfer Physics on the Observable Properties of Field Binary Black Hole Populations — **A&A** *2021*
*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*
*Astronomy & Astrophysics **647**, 153*

Black hole genealogy: Identifying hierarchical mergers with gravitational waves — **ApJ** *2020*
*C. Kimball, C. Talbot, C. Berry, M. Carney, **M. Zevin**, E. Thrane, V. Kalogera*
*The Astrophysical Journal **900** 177*

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

Teaching Citizen Scientists to Categorize Glitches using Machine Learning Guided Training — **CHB** *2019*
*C. Jackson, C. Østerlund, K. Crowston, M. Harandi, S. Allen, S. Bahaadini, S. Coughlin, 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** *2019*
*M. Arca Sedda, C. Berry, K. Jani, P. Amaro-Seoane, P. Auclair, J. Baird, T. Baker, E. Berti, 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** *2019*
*K. Crowston, C. Østerlund, T. Lee, C. Jackson, M. Harandi, S. Allen, S. Bahaadini, S. Coughlin, 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** *2019*
*K. Kremer, C. L. Rodriguez, P. Amaro-Seoane, K. Breivik, S. Chatterjee, M. L. Katz, 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** *2018*
*S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, **M. Zevin**, V. Kalogera, A. K. Katsaggelos*
25th IEEE International Conference on Image Processing Proceedings

Machine Learning for Gravity Spy: Glitch Classification and Dataset — **ISJ** *2018*
*S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, **M. Zevin**, J. R. Smith, V. Kalogera, 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*

[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

– *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*
– *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*

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

– *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*
– *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

Caltech/MIT LIGO–GRITTS Seminar *Virtual*
Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone *June 2021*

Fermi Lab Cosmic Physics Center Seminar *Virtual*
Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone *May 2021*

Yale Astronomy Colloquium *Virtual*
Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone *April 2021*

University of Chicago Astro Lunch Seminar *Virtual*
Unveiling the Lives and Deaths of Stars through Compact Object Mergers *January 2021*

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

NASA Hubble Fellowship Symposium (Talk) — *Virtual*
Research Overview — *September 2020*

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

Lifelong Learning **Lecture Series**
Remote *2021–Present*
– *Public talks to older adults throughout Chihcago*

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

Camille Liotine **Graduate**
HMXB Progenitors to Binary Black Hole Mergers; CIERA Graduate Student *2020–present*

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*
- *Nature Astronomy*
- *Physical Review D*
- *Physical Review Letters*