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** *2020–present*
- **KICP Postdoctoral Fellow** *2020–present*
- **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)

Observational Inference on the Delay Time Distribution of Short Gamma-ray Bursts — **ApJL** *2022*
M. Zevin, A. Nugent, S. Adhikari, W.-f. Fong, D. Holz, L. Kelley
The Astrophysical Journal Letters **940** L18
Citations: 5

Avoiding a Cluster Catastrophe: Retention Efficiency and the Binary Black Hole Mass Spectrum — **ApJL** *2022*
M. Zevin, D. Holz
The Astrophysical Journal Letters **935** L20
Citations: 7

Suspicious Siblings: The Distribution of Mass and Spin Across Component Black Holes in Isolated Binary Evolution — **ApJ** *2022*
M. Zevin, S. Bavera
The Astrophysical Journal **933** 86

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

Citations: 22

Implications of Eccentric Observations on Binary Black Hole Formation Channels **ApJL**
M. Zevin, I. Romero-Shaw, K. Kremer, E. Thrane, P. Lasky *2021*
The Astrophysical Journal Letters **921**, L43
Citations: 24

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
Citations: 146

Forward Modeling of Double Neutron Stars: Insights from Highly-Offset Short Gamma-ray Bursts **ApJ**
M. Zevin, L. Kelley, A. Nugent, W.-f. Fong, C. Berry, V. Kalogera *2020*
The Astrophysical Journal **904**, 190
Citations: 13

Exploring the Lower Mass Gap and Unequal Mass Regime in Compact Binary Evolution **ApJL**
M. Zevin, M. Spera, C. Berry, V. Kalogera *2020*
The Astrophysical Journal Letters **899**, L1
Citations: 94

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
Citations: 46

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
Citations: 29

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
Citations: 144
– 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
Citations: 71

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
Citations: 129

Gravity Spy: Integrating Advanced LIGO Detector Characterization, Machine Learning, and Citizen Science **CQG** *2017*
M. Zevin, S. Coughlin, S. Bahaadini, et al.
Classical and Quantum Gravity **34**, 064003
Citations: 142
– Covered by *AAS Press*

Highlighted Contributed Papers

Things that might go bump in the night: Assessing structure in the binary black hole mass spectrum
A Farah, B. Edelman, M. Zevin, M. Fishbach, J. Ezquiaga, B. Farr, D. Holz *2022*
The Astrophysical Journal (submitted), arxiv:2301.00834

[3] *M. Zevin*: Chair of paper-writing team and analysis lead

Inferring Interference: Identifying a Perturbing Tertiary with Eccentric Gravitational Wave Burst Timing *2022*
*I. Romero-Shaw, N. Loutrel, **M. Zevin***
The Astrophysical Journal (submitted), arxiv:2211.07278

The Missing Link Between Black Holes in High-Mass X-ray Binaries and Gravitational-Wave Sources: Observational Selection Effects *2022*
*C. Liotine, **M. Zevin**, C. Berry, Z. Doctor, V. Kalogera*
The Astrophysical Journal (submitted), arxiv:2210.01825

Cosmologically coupled compact objects: a single parameter model for LIGO–Virgo mass and redshift distributions **ApJL** *2021*
*K. Croker, **M. Zevin**, D. Farrah, K. Nishimura, G. Tarle*
The Astrophysical Journal Letters **922**, L22

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**, et al.*
Astronomy & Astrophysics **647**, 153

Approximations to the spin of close Black-hole–Wolf-Rayet binaries **RNAAS** *2021*
*S. Bavera, **M. Zevin**, T. Fragos*
Research Notes of the American Astronomical Society **5** 127

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

COSMIC Variance in Binary Population Synthesis **ApJ** *2019*
*K. Breivik, S. Coughlin, **M. Zevin**, et al.*
The Astrophysical Journal **898**, 71

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

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

Contributed Papers (with links)

A Preferential Growth Channel for Supermassive Black Holes in Elliptical Galaxies at zi2 *2022*
*D. Farrah, S. Petty, K. Croker, G. Tarlé, **M. Zevin**, et al.*
The Astrophysical Journal (accepted), arXiv: 2212.06854

Data quality up to the third observing run of Advanced LIGO: Gravity Spy glitch classifications *2022*
*J. Glanzer, S. Banagiri, S. Coughlin, S. Soni, C. Berry, **M. Zevin**, et al.*
Classical and Quantum Gravity (submitted), arXiv: 2208.12849

Intermediate-mass Black Holes on the Run from Young Star Clusters *2022*
*E. Gonzlez, K. Kremer, G. Fragione, M. Martinez, N. Weatherford, **M. Zevin**, F. Rasio*
The Astrophysical Journal (submitted), arXiv: 2208.07881

Discriminative Dimensionality Reduction using Deep Neural Networks for Clustering of LIGO Data *2022*
*S. Baahadini, Y. Wu, S. Coughlin, **M. Zevin**, A. Katsaggelos*
IEEE Transactions on Neural Networks and Learning Systems (submitted), arXiv: 2205.13672

Short GRB Host Galaxies II: A Legacy Sample of Redshifts, Stellar Population Properties, and Implications for their Neutron Star Merger Origins *2022*
*A. Nugent, W.-f. Fong, Y. Dong, J. Leja, E. Berger, **M. Zevin**, et al.*
The Astrophysical Journal (accepted), arXiv: 2206.01764

Black hole - black hole total merger mass and the origin of LIGO/Virgo sources

[4] ***M. Zevin***: Paper-writing team, populations and astrophysical implications lead

*K. Belczynski, Z. Doctor, **M. Zevin**, A. Olejak, S. Banerjee, D. Chattopadhyay* *2022*
The Astrophysical Journal **935**, 126

The $\chi_{\rm eff}z$ correlation of field binary black hole mergers and how 3G gravitational-wave detectors can constrain it
*S.S. Bavera, M. Fishbach, **M. Zevin**, E. Zapartas, T. Fragos* *2022*
Astronomy & Astrophysics **665**, A59

POSYDON: A General-Purpose Population Synthesis Code with Detailed Binary-Evolution Simulations
*T. Fragos, J.J. Andrews, S.S. Bavera, . . . , **M. Zevin*** *2021*
The Astrophysical Journal Supplements (submitted)
arXiv: 2202.05892

Stochastic gravitational-wave background as a tool to investigate multi-channel astrophysical and primordial black-hole mergers **A&A** *2022*
*S. Bavera, G. Franciolini, G. Cusin, A. Riotto, **M. Zevin**, T. Fragos*
Astronomy & Astrophysics **660**, 26

Probing the progenitors of spinning binary black-hole mergers with long gamma-ray bursts **A&A** *2022*
*S. Bavera, T. Fragos, E. Zapartas, E. Ramirez-Ruiz, P. Marchant, L. Kelley, **M. Zevin**, et al.*
Astronomy & Astrophysics Letters **657**, L8

Evidence for Hierarchical Black Hole Mergers in the Second LIGO–Virgo Gravitational-Wave Catalog **ApJL** *2020*
*C. Kimball, C. Talbot, C. Berry, **M. Zevin**, E. Thrane, V. Kalogera, et al.*
The Astrophysical Journal Letters **915**, L35

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, et al.*
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, . . . , **M. Zevin**, S. Naoz, F. A. Rasio*
The Astrophysical Journal **903**, 67

Teaching Citizen Scientists to Categorize Glitches using Machine Learning Guided Training **CHB** *2020*
*C. Jackson, C. Østerlund, K. Crowston, . . . , **M. Zevin***
Computers in Human Behavior **105**, 106198

The Missing Link in Gravitational-Wave Astronomy: Discoveries waiting in the decihertz range **CQG** *2020*
*M. Arca Sedda, C. Berry, K. Jani, . . . , **M. Zevin***
Classical and Quantum Gravity **37**, 215011 (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, . . . , **M. Zevin***
IEEE Transactions on Learning Technologies **13**, 1

Classifying the Unknown: Discovering Novel Gravitational-Wave Detector Glitches using Similarity Learning **PRD** *2019*
*S. Coughlin, S. Bahaadini, N. Rohani, **M. Zevin**, et al.*
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, . . . , **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, A. K. Katsaggelos* *2018*
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)

papers with significant contributions from M. Zevin are marked with footnotes

– All-sky, all-frequency directional search for persistent gravitational waves from Advanced LIGO's and Advanced Virgo's first three observing runs
– First joint observation by the underground gravitational-wave detector KAGRA with GEO 600
– Narrowband Searches for Continuous and Long-duration Transient Gravitational Waves from Known Pulsars in the LIGO-Virgo Third Observing Run
– Search for continuous gravitational wave emission from the Milky Way center in O3 LIGO–Virgo data
– Search of the early O3 LIGO data for continuous gravitational waves from the Cassiopeia A and Vela Jr. supernova remnants
– Search for Gravitational Waves Associated with Gamma-Ray Bursts Detected by Fermi and Swift during the LIGO-Virgo Run O3b
– Search for Gravitational Waves Associated with Fast Radio Bursts Detected by CHIME/FRB During the LIGO–Virgo Observing Run O3a
– Constraints on dark photon dark matter using data from LIGO's and Virgo's third observing run
– Search for intermediate-mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo
– Search for gravitational waves from Scorpius X-1 with a hidden Markov model in O3 LIGO data
– All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO and Advanced Virgo O3 data
– Narrowband searches for continuous and long-duration transient gravitational waves from known pulsars in the LIGO-Virgo third observing run
– Tests of General Relativity with GWTC-3
– All-sky search for short gravitational-wave bursts in the third Advanced LIGO and Advanced Virgo run
– Search for Lensing Signatures in the Gravitational-Wave Observations from the First Half of LIGO-Virgo's Third Observing Run
– All-sky search for gravitational wave emission from scalar boson clouds around spinning black holes in LIGO O3 data
– Searches for Gravitational Waves from Known Pulsars at Two Harmonics in the Second and Third LIGO-Virgo Observing Runs
– The population of merging compact binaries inferred using gravitational waves through GWTC-3[5]
– GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run[6]

[5] ***M. Zevin***: Astrophysical interpretation review lead, code reviewer for high-mass injection set
[6] ***M. Zevin***: Parameter estimation section review lead

– Constraints on the cosmic expansion history from GWTC-3
– All-sky search for long-duration gravitational-wave bursts in the third Advanced LIGO and Advanced Virgo run
– Constraints from LIGO O3 Data on Gravitational-wave Emission Due to R-modes in the Glitching Pulsar PSR J0537-6910
– Searches for Continuous Gravitational Waves from Young Supernova Remnants in the Early Third Observing Run of Advanced LIGO and Virgo
– All-sky search for continuous gravitational waves from isolated neutron stars in the early O3 LIGO data
– Search for subsolar-mass binaries in the first half of Advanced LIGO and Virgo's third observing run
– Search for continuous gravitational waves from 20 accreting millisecond X-ray pulsars in O3 LIGO data
– GWTC-2.1: Deep Extended Catalog of Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run
– Search for anisotropic gravitational-wave backgrounds using data from Advanced LIGO and Advanced Virgo's first three observing runs
– Upper limits on the isotropic gravitational-wave background from Advanced LIGO and Advanced Virgo's third observing run
– Observation of Gravitational Waves from Two Neutron Star-Black Hole Coalescences
– Search for Gravitational Waves Associated with Gamma-Ray Bursts Detected by Fermi and Swift During the LIGO-Virgo Run O3a
– Constraints on Cosmic Strings Using Data from the Third Advanced LIGO-Virgo Observing Run
– Tests of general relativity with binary black holes from the second LIGO-Virgo gravitational-wave transient catalog
– Diving below the Spin-down Limit: Constraints on Gravitational Waves from the Energetic Young Pulsar PSR J0537-6910
– 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[7]
– 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[8]
– Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs

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

– 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[9]
– 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
– 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[10]
– 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[11]
– 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

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

– 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
– 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

CITA Seminar — *Toronto, CA*
Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone — November 2022

AAS HEAD Meeting — *Pittsburgh, PA*
One Channel to Rule Them All? Deciphering the Formation Pathways of Compact Object Mergers — March 2022

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

NHFP Symposium (Talk) — *Baltimore, MD*
Lessons learned from the galactic hosts of short gamma-ray bursts — September 2022

Post-PAX Meeting (Talk) — *Cambridge, MA*
Formation Channels of Binary Black Holes: Open Questions — August 2022

Intermediate-Mass Black Holes: New Science from Stellar Evolution to Cosmology (Talk) — *San Juan, PR*
The growth of intermediate-mass black holes through hierarchical mergers: implications for ground-based gravitational-wave detections — April 2022

APS April Meeting (Talk) — *New York, NY*
Lessons learned from the galactic hosts of short gamma-ray bursts — April 2022

Aspen Winter Conference (Talk) — *Aspen, CO*
Growing Black Holes: The Impact of Retention Efficiency on Hierarchical Mergers and the BBH Mass Spectrum — January 2022

NHFP Symposium (Talk) — *Virtual*
Constraining dynamical formation channels of binary black holes with eccentric observations — September 2021

Amaldi 14 (Talk) — *Virtual*
Constraining dynamical formation channels of binary black holes with eccentric observations — July 2021

NHFP 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 & Outreach

Gravity Spy — **Citizen Science**
Researcher, Developer — *2015–Present*

– Developed Zooniverse citizen science project to classify and characterize LIGO–Virgo detector data, as part of a team of gravitational wave, machine learning, Zooniverse, and social scientists
– Led construction of user interface on the Zooniverse Lab platform, point person for communication between the Zooniverse volunteers and science team
– Project has accumulated over 7,000,000 classifications from over 30,000 registered users (December 2022)

Lifelong Learning **Talk Series**
Organizer *2021–2022*
– Public talk series for seniors, based in public libraries and senior centers in the Chicago-land area.

Astrobites **Blog**
Author, Administrator, & Leadership Team *2014–2020*
– 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 *2017–2020*
– National graduate-student run science communication workshop for graduate students in STEM fields

Astronomy on Tap **Public Event**
Co-founder, organizer, host, speaker *2015–2020*
– 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 *2016–2019*
– 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*
– Public presentations at the Adler Planetarium for museum guests

Lifelong Learning: JWST **Lecture Series**
Remote *November 2022*

Art of Science **Invited Speaker**
Chicago, IL *October 2022*

Hinsdale Social Studies Circle: Uncovering the Universe's Symphony **Invited Speaker**
Virtual *January 2022*

Finding Genius Podcast **Invited Speaker**
Virtual *December 2021*

Lifelong Learning: Gravitational Waves **Lecture Series**
Remote *November 2021*

Lifelong Learning: Gravitational Waves **Lecture Series**
Remote *March 2021*

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

Astronomer Evenings — **Lecture Series**
Northwestern University, Dearborn Observatory — *2016–2019*
– Presentations during public observing hours at the Dearborn Observatory

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**) — *2014–2020*

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

University of Chicago — **Guest Lecturer**
Graduate Level Stellar Astrophysics — *2022–Present*

Northwestern University — **Lecturer/TA**
Introduction to Astronomy, Stellar Astrophysics, Data-Driven Research in Astronomy — *2015–2017*
– 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 **Museum Education**
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

Aditya Vijaykumar **Graduate**
Evolution of binary neutron stars in cosmological simulations; KICP Visiting Graduate Student *2022–present*

Anya Nugent **Graduate**
Host demographics and progenitors of short GRBs; CIERA Graduate Student *2021–present*

Amanda Farah **Graduate**
Cosmology from evolving non-parametric mass distribution; University of Chicago Graduate Student *2021–present*

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

Simone Bavera **Graduate**
Isolated Evolution and Tidal Spin-up of Wolf-Rayet Stars; University of Geneva Graduate Student *2019–2021*

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

- **NHFP DEI Working Group:** Statistics Co-Lead *2020–present*
- **GWPAW Conference:** Scientific Organizing Committee *2022*
- **NHFP Symposium:** Scientific Organizing Committee *2022*
- **Lifelong Learning:** Organizer *2021–2022*
- **Astrobites:** Administrator, Author *2014–2020*
- **ComSciCon National:** Organizer *2017–2020*
- **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 *2018–2020*
- **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

Served on NSF panel *2021*

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*