

Michael J. Zevin || Curriculum Vitae

Adler Planetarium — 1300 South DuSable Lake Shore Drive, — Chicago, IL 60605

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Astrophysicist at the Adler Planetarium with research interests in gravitational waves, compact objects, high-energy transients, stellar evolution, and citizen science.

Academic Positions

Adler Planetarium Astronomer	Chicago, IL 2023–Present
Northwestern University CIERA Visiting Scholar	Evanston, IL 2023–Present
University of Chicago NASA Hubble Fellowship Program: Hubble Postdoctoral Fellow Zhengtong/Enrico Fermi Postdoctoral Fellow KICP Fellow	Chicago, IL 2020–2023

Education

Northwestern University <i>Ph.D. in Physics and Astronomy</i> <ul style="list-style-type: none">▷ Thesis: Unveiling the Lives and Deaths of Stars through Compact Object Mergers▷ Advisor: Vicky Kalogera▷ Additional Certificates: Integrated Data Science	Evanston, IL August 2020
<i>Master of Science in Physics and Astronomy</i>	December 2016
University of Illinois <i>Bachelor of Science</i> <ul style="list-style-type: none">▷ Double Major in Astronomy and Physics▷ Minor in Music Performance	Champaign, IL May 2012

Awards & Honors

▷ IOP Publishing Top Cited Paper Award ¹	2023
▷ NASA Hubble Fellowship Program: Hubble Postdoctoral Fellow	2020–2023
▷ Zhengtong/Enrico Fermi Postdoctoral Fellow	2020–2023
▷ KICP Postdoctoral Fellow	2020–2023
▷ Oxford Centre for Cosmological Studies Balzan Fellowship ²	2018
▷ Illinois Space Grant Consortium Fellowship	2017–2020
▷ NSF GK12 Fellowship	2017–2018
▷ Kavli Summer Fellowship ³	2017
▷ NSF IDEAS Fellowship	2016–2020

¹Zevin et al. 2020a & Zevin et al. 2021a both in the top 1% of most-cited articles in IOP Journals between 2020–2022

²Research Advisor: Dr. Chris Lintott (New College, University of Oxford)

³Research Advisor: Dr. Enrico Ramirez-Ruiz (University of California Santa Cruz)

- ▷ **National Science Foundation Graduate Research Fellowship** (*honorable mention*) 2016
- ▷ **Gruber Cosmology Prize** (*as part of the LIGO-Virgo Collaboration*) 2016
- ▷ **Breakthrough Prize in Fundamental Physics** (*as part of the LIGO-Virgo Collaboration*) 2016
- ▷ **First Place in Poster Competition** (*Computational Research Day, Northwestern University*) 2016
- ▷ **High Distinction in Physics** (*University of Illinois Urbana-Champaign*) 2012

Publications

all paper titles are hyperlinked to their ADS entries

First Author Papers

- <https://ui.adsabs.harvard.edu/abs/2023arXiv230815530Z/abstract> EPJ+
2023
M. Zevin, C. Jackson, Z. Doctor, et al.
 The European Physical Journal Plus (submitted)
 Invited article for focus issue on citizen science for physics
- 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: 17
- 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: 12
- 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
 Citations: 33
- Implications of Eccentric Observations on Binary Black Hole Formation Channels** ApJL
2021
M. Zevin, I. Romero-Shaw, K. Kremer, E. Thrane, P. Lasky
 The Astrophysical Journal Letters **921**, L43
 Citations: 44
- 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: 204
- Forward Modeling of Double Neutron Stars: Insights from Highly-Offset Short Gamma-ray Bursts** ApJ
2020
M. Zevin, L. Kelley, A. Nugent, W.-f. Fong, C. Berry, V. Kalogera
 The Astrophysical Journal **904**, 190
 Citations: 15
- 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
 Citations: 114
- 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
 Citations: 54

- Can Neutron-Star Mergers Explain the r-process Enrichment in Globular Clusters?** ApJ
2019
M. Zevin, K. Kremer, D. M. Siegel, S. Coughlin, B. T.-H. Tsang, C. P. L. Berry, V. Kalogera
 The Astrophysical Journal **886**, 1
 Citations: 34
- Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters** ApJ
2019
M. Zevin, J. Samsing, C. L. Rodriguez, C. J. Haster, E. Ramirez-Ruiz
 The Astrophysical Journal **871**, 91
 Citations: 173
 – Covered by AAS Nova
- Constraining Formation Models of Binary Black Holes with Gravitational-Wave Observations** ApJ
2017
M. Zevin, C. Pankow, C. Rodriguez, L. Sampson, E. Chase, V. Kalogera, F. Rasio
 The Astrophysical Journal **846**, 82
 Citations: 144
- 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: 170
 – Covered by AAS Press
- Highlighted Contributed Papers**
- What You Don't Know Can Hurt You: Use and Abuse of Astrophysical Models in Gravitational-wave Population Analyses** 2023
A.Q. Cheng, M. Zevin, S. Vitale
 The Astrophysical Journal (submitted), arxiv:2307.03129
- Things that might go bump in the night: Assessing structure in the binary black hole mass spectrum** 2022
A Farah, B. Edelman, M. Zevin, M. Fishbach, J. Ezquiaga, B. Farr, D. Holz
 The Astrophysical Journal (submitted), arxiv:2301.00834
- Inferring Interference: Identifying a Perturbing Tertiary with Eccentric Gravitational Wave Burst Timing** 2022
I. Romero-Shaw, N. Loutrel, M. Zevin
 The Astrophysical Journal (accepted), arxiv:2211.07278
- The Missing Link Between Black Holes in High-Mass X-ray Binaries and Gravitational-Wave Sources: Observational Selection Effects** ApJ
2023
C. Liotine, M. Zevin, C. Berry, Z. Doctor, V. Kalogera
 The Astrophysical Journal **946**, 4
- 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
- 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 <i>C. Rodriguez, M. Zevin, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. A. Rasio, C. S. Ye</i> Physical Review D 100 , 043027	PRD 2019
Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO <i>C. Rodriguez, M. Zevin, C. Pankow, V. Kalogera, F. A. Rasio</i> The Astrophysical Journal Letters 832 , L2	ApJL 2016
Collaboration Papers as part of the LIGO Scientific Collaboration (2015–Present) only papers with significant contributions from M. Zevin are listed, click here for full list	
The population of merging compact binaries inferred using gravitational waves through GWTC-3 Physical Review X 13 , 011048 – M. Zevin : Astrophysical interpretation review lead, code reviewer for high-mass injection set	PRX 2023
Search for intermediate-mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo Astronomy and Astrophysics 659 , A84 – M. Zevin : Reviewer for high-mass injection set	A&A 2022
GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run Physical Review X (submitted), arxiv:2111.03634 – M. Zevin : Parameter estimation section review lead	 2021
Properties and Astrophysical Implications of the 150 M_{\odot} Binary Black Hole Merger GW190521 The Astrophysical Journal Letters 900 , L13 – M. Zevin : Astrophysical implications reviewer	ApJL 2020
GW190412: Observation of a Binary-Black-Hole Coalescence with Asymmetric Masses Physical Review D 102 , 043015 – M. Zevin : Paper-writing team, populations and astrophysical implications lead, education and public outreach liaison, science summary writer, science case study team	PRD 2020
GW190814: Gravitational Waves from the Coalescence of a 23 Solar Mass Black Hole with a 2.6 Solar Mass Compact Object The Astrophysical Journal Letters 896 , L44 – M. Zevin : Astrophysical implications reviewer	ApJL 2020
Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo The Astrophysical Journal Letters 882 , L24 – M. Zevin : Education and public outreach liaison, science summary writer	ApJL 2019
On the Progenitor of Binary Neutron Star Merger GW170817 The Astrophysical Journal Letters 850 , L40 – M. Zevin : Chair of paper-writing team, analysis lead	ApJL 2017
GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral Physical Review Letters 119 , 161101 – M. Zevin : Education and public outreach liaison	PRL 2017
Observation of Gravitational Waves from a Binary Black Hole Merger Physical Review Letters 116 , 061102 – M. Zevin : Ran exploratory parameter estimation	PRL 2016
Contributed Papers	
Data quality up to the third observing run of Advanced LIGO: Gravity Spy glitch classifications <i>J. Glanzer, S. Banagiri, S. Coughlin, S. Soni, C. Berry, M. Zevin, et al.</i> Classical and Quantum Gravity 40 , 065004	CQG 2023

POSDON: A General-Purpose Population Synthesis Code with Detailed Binary-Evolution Simulations **ApJS**
T. Fragos, J.J. Andrews, S.S. Bavera, . . . , M. Zevin
The Astrophysical Journal Supplements **264**, 45 **2023**

Observational evidence for cosmological coupling of black holes and its implications for an astrophysical source of dark energy **ApJL**
D. Farrah, K. Croker, M. Zevin, et al.
The Astrophysical Journal Letters **944**, L31 **2023**

A Preferential Growth Channel for Supermassive Black Holes in Elliptical Galaxies at $z \geq 2$ **ApJ**
D. Farrah, S. Petty, K. Croker, G. Tarlé, M. Zevin, et al.
The Astrophysical Journal **943**, 133 **2023**

Intermediate-mass Black Holes on the Run from Young Star Clusters **ApJ**
E. Gonzalez, K. Kremer, G. Fragione, M. Martinez, N. Weatherford, M. Zevin, F. Rasio
The Astrophysical Journal **940**, 131 **2022**

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 **ApJ**
A. Nugent, W.-f. Fong, Y. Dong, J. Leja, E. Berger, M. Zevin, et al.
The Astrophysical Journal **935**, 126 **2022**

Black hole - black hole total merger mass and the origin of LIGO/Virgo sources **ApJ**
K. Belczynski, Z. Doctor, M. Zevin, A. Olejak, S. Banerjee, D. Chattopadhyay
The Astrophysical Journal **935**, 126 **2022**

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

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

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

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

The Impact of Mass-Transfer Physics on the Observable Properties of Field Binary Black Hole Populations **A&A**
S. Bavera, T. Fragos, M. Zevin, C. Berry, P. Marchant, J. Andrews, S. Coughlin, A. Dotter, et al.
Astronomy & Astrophysics **647**, 153 **2021**

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

Black Hole Mergers from Hierarchical Triples in Dense Star Clusters **ApJ**
M. Martinez, G. Fragione, K. Kremer, . . . , M. Zevin, S. Naoz, F. A. Rasio
The Astrophysical Journal **903**, 67 **2020**

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

The Missing Link in Gravitational-Wave Astronomy: Discoveries waiting in the decihertz range <i>M. Arca Sedda, C. Berry, K. Jani, . . . , M. Zevin</i> Classical and Quantum Gravity 37 , 215011 (ESA's Voyage 2050 White Paper)	CQG 2020
Knowledge Tracing to Model Learning in Online Citizen Science Projects <i>K. Crowston, C. Østerlund, T. Lee, . . . , M. Zevin</i> IEEE Transactions on Learning Technologies 13 , 1	IEEE TLT 2019
Classifying the Unknown: Discovering Novel Gravitational-Wave Detector Glitches using Similarity Learning <i>S. Coughlin, S. Bahaadini, N. Rohani, M. Zevin, et al.</i> Physical Review D 99 , 082002	PRD 2019
Post-Newtonian Dynamics in Dense Star Clusters: Binary Black Holes in the LISA Band <i>K. Kremer, C. L. Rodriguez, . . . , M. Zevin</i> Physical Review D 99 , 063003	PRD 2019
Post-Newtonian Dynamics in Dense Star Clusters: Formation, Masses, and Merger Rates of Highly-Eccentric Black Hole Binaries <i>C. L. Rodriguez, P. Amaro-Seoane, S. Chatterjee, K. Kremer, F. A. Rasio, J. Samsing, C. S. Ye, M. Zevin</i> Physical Review D 98 , 123005	PRD 2018
DIRECT: Deep Discriminative Embedding for Clustering of LIGO Data <i>S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, M. Zevin, V. Kalogera, A. K. Katsaggelos</i> 25th IEEE International Conference on Image Processing Proceedings	ICIP 2018
Machine Learning for Gravity Spy: Glitch Classification and Dataset <i>S. Bahaadini, V. Noroozi, N. Rohani, S. Coughlin, M. Zevin, J. R. Smith, V. Kalogera, A. K. Katsaggelos</i> Information Sciences Journal 444 , 172	ISJ 2018
Improvements in Gravitational-wave Sky Localization with Expanded Networks of Interferometers <i>C. Pankow, E. A. Chase, S. Coughlin, M. Zevin, V. Kalogera</i> The Astrophysical Journal Letters 854 , L25	ApJL 2018
Deep Multi-view Models for Glitch Classification <i>S. Bahaadini, N. Rohani, S. Coughlin, M. Zevin, V. Kalogera, A. K. Katsaggelos</i> IEEE International Conference on Acoustics, Speech, and Signal Processing Proceedings	ICASSP 2018
Incorporating Current Research into Formal Higher Education Settings using Astrobites <i>N. E. Sanders, S. Kohler, C. Faesi, A. Villar, M. Zevin</i> American Journal of Physics 85 , 741	AJP 2017
Astrophysical Prior Information and Gravitational-Wave Parameter Estimation <i>C. Pankow, L. Sampson, L. Perri, E. A. Chase, S. Coughlin, M. Zevin, V. Kalogera</i> The Astrophysical Journal 834 , 154	APJ 2017

Presentations

Invited Talks	
Notre Dame Astrophysics Seminar <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	<i>South Bend, IN</i> November 2023
Caltech TAPIR Seminar <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	<i>Pasadena, CA</i> May 2023
CITA Seminar <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	<i>Toronto, Canada</i> November 2022
AAS HEAD Meeting <i>One Channel to Rule Them All? Deciphering the Formation Pathways of Compact Object Mergers</i>	<i>Pittsburgh, PA</i> March 2022

Caltech/MIT LIGO–GRITTS Seminar <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	Virtual June 2021
Fermi Lab Cosmic Physics Center Seminar <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	Virtual May 2021
Yale Astronomy Colloquium <i>Deciphering the Biography of Massive Stars: Compact Object Mergers as a Rosetta Stone</i>	Virtual April 2021
University of Chicago Astro Lunch Seminar <i>Unveiling the Lives and Deaths of Stars through Compact Object Mergers</i>	Virtual January 2021
Zooniverse Transient Workshop <i>Gravity Spy: Leveling Up & Training Volunteers using Machine Learning</i>	Virtual November 2020
Cosmic Explorer Panel <i>Binary Formation, panelist</i>	Virtual October 2020
Perimeter Institute Strong Gravity Seminar <i>Deciphering the Landscape of Compact Binary Formation Channels</i>	Waterloo, ON December 2019
AEI Seminar <i>Deciphering the Landscape of Compact Binary Formation Channels</i>	Postdam, DE December 2019
Caltech TAPIR Seminar <i>Deciphering the Landscape of Compact Binary Formation Channels</i>	Pasadena, CA November 2019
UCLA Lunch Talk <i>Deciphering the Landscape of Compact Binary Formation Channels</i>	Los Angeles, CA November 2019
UCSC FLASH Seminar <i>Deciphering the Landscape of Compact Binary Formation Channels</i>	Santa Cruz, CA November 2019
UCSB Astro Lunch <i>Deciphering the Landscape of Binary Black Hole Formation Channels</i>	Santa Barbara, CA November 2019
Colombia Astronomy Seminar <i>Getting the boot: Lonely GRBs, enigmatic r-process, and the birth of neutron stars</i>	New York, NY October 2019
MIT GRITTS Seminar <i>Unveiling the Lives and Deaths of Stars through Compact Object Mergers</i>	Cambridge, MA October 2019
CfA High Energy Astrophysics Seminar <i>Deciphering the Landscape of Binary Black Hole Formation Channels</i>	Cambridge, MA October 2019
CGCA Seminar <i>Unveiling the Lives and Deaths of Stars through Compact Object Mergers</i>	Milwaukee, WI March 2019
IGC Seminar <i>From the Detected to the Detectors: Using Gravitational Waves to Enable Insights from the Stellar Graveyard & the Next Generation of Citizen Science</i>	Portsmouth, UK March 2018
SPI-MAX Seminar <i>From the Detected to the Detectors: Using Gravitational Waves to Enable Insights from the Stellar Graveyard & the Next Generation of Citizen Science</i>	Oxford, UK February 2018
Contributed Talks, Panels, & Posters	
APS April Meeting (Talk) <i>Astrophysical Implications of Eccentric Black Hole Mergers</i>	Minneapolis, MN April 2023
GWPAW (Panel) <i>Panel discussion chair, Scientific Organizing Committee</i>	Melbourne, Australia December 2022
NHFP Symposium (Talk) <i>Lessons learned from the galactic hosts of short gamma-ray bursts</i>	Baltimore, MD September 2022
Post-PAX Meeting (Talk) <i>Formation Channels of Binary Black Holes: Open Questions</i>	Cambridge, MA August 2022

Intermediate-Mass Black Holes: New Science from Stellar Evolution to Cosmology (Talk) <i>The growth of intermediate-mass black holes through hierarchical mergers: implications for ground-based gravitational-wave detections</i>	San Juan, PR April 2022
APS April Meeting (Talk) <i>Lessons learned from the galactic hosts of short gamma-ray bursts</i>	New York, NY April 2022
Aspen Winter Conference (Talk) <i>Growing Black Holes: The Impact of Retention Efficiency on Hierarchical Mergers and the BBH Mass Spectrum</i>	Aspen, CO January 2022
NHFP Symposium (Talk) <i>Constraining dynamical formation channels of binary black holes with eccentric observations</i>	Virtual September 2021
Amaldi 14 (Talk) <i>Constraining dynamical formation channels of binary black holes with eccentric observations</i>	Virtual July 2021
NHFP Symposium (Talk) <i>Research Overview</i>	Virtual September 2020
Aspen Winter Conference (Talk) <i>Eccentric Black Hole Mergers in Dense Star Clusters: Post-Newtonian Effects & Higher Multiplicity Encounters</i>	Aspen, CO February 2019
AAS 233 (Talk) <i>Eccentric Black Hole Mergers in Dense Star Clusters: The Role of Binary-Binary Encounters</i>	Seattle, WA January 2019
NSF Research Traineeship Annual Meeting (Poster) <i>Gravity Spy: Integrating Gravitational-Wave Astrophysics, Machine Learning, and Citizen Sciences</i>	Washington, DC September 2018
MODEST-18 (Talk) <i>The Role of Binary-Binary Interactions in Inducing Eccentric Black Hole Mergers</i>	Santorini, Greece June 2018
APS April Meeting (Talk) <i>On the Progenitor of Binary Neutron Star Merger GW170817</i>	Columbus, OH April 2018
Detecting the Unexpected: Discovery in the Era of Astronomically Big Data (Talk) <i>The Future of Citizen Science: Coupling Crowdsourcing and Machine Learning</i>	Baltimore, MD March 2017
APS April Meeting (Talk) <i>Discriminating Formation Channels of Binary Black Hole Systems with Advanced LIGO</i>	Washington, DC January 2017
AAS 229 (Talk) <i>Discriminating Formation Channels of Binary Black Hole Systems with Advanced LIGO</i>	Grapevine, TX January 2017
AAS 229 (Workshop & Poster) <i>Astrobits: Engaging Undergraduate Science Majors with Current Astrophysical Research</i>	Grapevine, TX January 2017
AAS 228 (Talk) <i>Gravity Spy: Integrating aLIGO detector characterization, machine learning, and citizen science</i>	San Diego, CA June 2016
Northwestern Computational Research Exposition (Poster) <i>Integrating aLIGO detector characterization, machine learning, and citizen science</i> – Awarded first prize in poster competition	Evanston, IL April 2016
Midwest Relativity Meeting (Talk) <i>LIGO glitch classification through the combination of machine learning and citizen science</i>	Evanston, IL 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 (January 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.
- Astrobiters** **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 *2014–2020*
 – 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 <i>Remote</i>	Lecture Series <i>November 2021</i>
Lifelong Learning: Gravitational Waves <i>Remote</i>	Lecture Series <i>March 2021</i>
UBS Investment Banking: Gravity Spy and LIGO <i>Virtual</i>	Invited Speaker <i>September 2020</i>
Astronomer Evenings <i>Northwestern University, Dearborn Observatory</i> – Presentations during public observing hours at the Dearborn Observatory	Lecture Series <i>2016–2019</i>
Chipping Norton Amateur Astronomy Group <i>Chipping Norton, UK</i>	Keynote Lecture <i>February 2018</i>
Take Our Children to Work Day <i>Northwestern University</i>	Lecture <i>April 2016, 2018</i>
Haven Midde School <i>Evanston, IL</i>	Invited Speaker <i>April 2017, 2018</i>
Chicago Astronomical Society <i>Adler Planetarium</i>	Keynote Lecture <i>May 2017</i>
Avery Coonley School <i>Downers Grove, IL</i>	Invited Speaker <i>May 2017</i>
Seven Minutes of Science: An Interdisciplinary Symposium <i>Northwestern University</i>	Public Talk <i>April 2017</i>
Highcrest Elementary <i>Wilmette, IL</i>	Invited Speaker <i>March 2017</i>
Einstein Evenings <i>Northwestern University, Dearborn Observatory</i> – Monthly presentations during observing hours on LIGO discoveries in celebration of the 100th anniversary of General Relativity	Lecture Series <i>2015–2016</i>
Nettlehorst Elementary <i>Chicago, IL</i>	Invited Speaker <i>February 2016</i>

Publications

Astrobites <i>Authored over 20 blog posts on current research in astrophysics (Link)</i>	Blog <i>2014–2020</i>
LIGO Science Summary <i>Companion science summary to the LIGO–Virgo O2 Populations paper (Link)</i> <i>Companion science summary to the GW170817 Detection paper (Link)</i>	Article <i>November 2018</i> <i>October 2017</i>
LIGO Magazine <i>The Gravity Spy Project — Machine Learning and Citizen Science (Link)</i>	Magazine Article <i>March 2017</i>
Helix Magazine <i>The Legacy of Scientific Discovery (Link)</i>	Magazine Article <i>March 2017</i>

Teaching & Work Experience

University of Chicago <i>Graduate Level Stellar Astrophysics, Graduate Level Space Physics</i>	Guest Lecturer <i>2022–Present</i>
Northwestern University <i>Introduction to Astronomy, Stellar Astrophysics, Data-Driven Research in Astronomy</i> – Guest lectured, developed assignments, graded, and ran telescope observing sessions	Lecturer/TA <i>2015–2017</i>

GK12 Fellowship <i>Reach for the Stars</i> ; Evanston, IL	Teaching 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 <i>Lead Teacher</i> ; Chicago, IL	Teaching 2013–2015
– Taught classes of 3–12 year old students in hands-on, experiential science classes	
– Designed curriculum for science summer camps	
Adler Planetarium <i>Mission Specialist, Science Leadership Corps Instructor</i> ; Chicago, IL	Museum Education 2012–2014
– Facilitated exhibits, performed experiments, and gave astronomy talks to the public	
– Designed educational programming	
– Led under-represented students in designing experiments for high-altitude balloon launches	
Students Mentored	
Alex Hanselman <i>Self-consistent eccentricity definitions</i> ; University of Chicago Graduate Student	Graduate 2023–present
Ethan Payne <i>Measurability of spin and precession in hierarchical mergers</i> ; Caltech Graduate Student	Graduate 2022–present
April Cheng <i>Multi-channel model selection with GWTC-3</i> ; MIT Undergraduate Student	Undergraduate 2022–present
Aditya Vijaykumar <i>Evolution of binary neutron stars in cosmological simulations</i> ; KICP Visiting Graduate Student	Graduate 2022–present
Anyu Nugent <i>Host demographics and progenitors of short GRBs</i> ; CIERA Graduate Student	Graduate 2021–present
Amanda Farah <i>Cosmology from evolving non-parametric mass distribution</i> ; University of Chicago Graduate Student	Graduate 2021–present
Camille Liotine <i>HMXB Progenitors to Binary Black Hole Mergers</i> ; CIERA Graduate Student	Graduate 2020–2023
Simone Bavera <i>Isolated Evolution and Tidal Spin-up of Wolf-Rayet Stars</i> ; University of Geneva Graduate Student	Graduate 2019–2021
Michael Kurkowski <i>Pair Instability Supernova Prescriptions in Binary Population Synthesis</i> ; CIERA REU Student	Undergraduate 2019
Jared Machtinger <i>Population properties of binary black holes detected by LIGO</i> ; CIERA Summer Student	High School 2019
Danai Avdela <i>Population properties of binary black holes detected by LIGO</i> ; CIERA Summer Student	High School 2019
Isaac Rivera <i>Offset distributions of short gamma-ray bursts</i> ; CIERA REU Student	Undergraduate 2018
Grace Kern <i>Optimization of Gravity Spy image retirement</i> ; CIERA Summer Student	High School 2018
Hannah Stein <i>Optimization of Gravity Spy image retirement</i> ; CIERA Summer Student	High School 2018
Yuqi Yun <i>Gaussian Process regression of black hole mass distributions</i> ; CIERA REU Student	Undergraduate 2016
Sophie Haight <i>Gaussian Process regression of binary stellar evolution sequences</i> ; CIERA Summer Student	High School 2016

Affiliations & Leadership Positions

▷ LSST Discovery Alliance: Institutional Representative	2023–present
▷ GWPAW Conference: Scientific Organizing Committee	2022
▷ NHFP Symposium: Scientific Organizing Committee	2022
▷ Lifelong Learning: Organizer	2021–2022
▷ NHFP DEI Working Group: Statistics Co-Lead	2020–2022
▷ ComSciCon National: Organizer	2017–2020
▷ American Astronomical Society: Member	2016–Present
▷ American Physical Society: Member	2016–Present
▷ American Astronomical Society, Media Intern	2016
▷ Physics and Astronomy Graduate Student Council: Quality of Life Chair	2016–2018
▷ Rapid Fire Research: Founder, chair	2016–2018
▷ LIGO Scientific Collaboration: Member	2015–Present
▷ Astrobiters: Administrator, Author	2014–2020
▷ Chicago Metropolitan Symphony Orchestra: Double Bassist	2014–2020

Service Work

Served on NSF panel	2021
Peer Reviewer for:	2017–Present
– <i>Astronomy and Astrophysics</i>	
– <i>The Astrophysical Journal</i>	
– <i>The Astrophysical Journal Letters</i>	
– <i>Monthly Notices of the Royal Astronomical Society</i>	
– <i>Nature Astronomy</i>	
– <i>Physical Review D</i>	
– <i>Physical Review Letters</i>	