

Katie Breivik

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Education

2018	Ph.D. in Physics & Astronomy	Northwestern University
2015	M.S. in Physics & Astronomy	Northwestern University
2012	B.S. in Physics with Professional Emphasis, Cum Laude	Utah State University

Work Experience

2023 - now	Carnegie Mellon University Assistant Professor of Physics	Pittsburgh, PA
2020 - 2023	Center for Computational Astrophysics Flatiron Research Fellow	New York City, NY
2018 - 2020	Canadian Institute for Theoretical Astrophysics CITA Fellow	Toronto, ON
2013 - 2018	Northwestern University Research Assistant	Evanston, IL

Honors & Awards

2025	Falco-DeBenedetti Assistant Professorship Early Career Development Chair
2020	Flatiron Research Fellowship Independent postdoctoral research fellowship
2019	Jeffrey L. Bishop Fellowship Bi-annually awarded to CITA postdoc: \$3,000
2018	CITA Fellowship Independent postdoctoral research fellowship
2017	Blue Apple Award Best student talk at the 27th Midwest Relativity Meeting
2017	NSF GK-12 'Reach for the Stars' Fellowship Graduate Teaching Fellowship
2017	Chambliss Award Honorable Mention, 229th AAS Meeting
2016	Northwestern Physics & Astronomy Rapid Fire Research 2nd Place
2014	Illinois Space Grant Consortium Graduate Fellowship \$10,000
2010	Undergraduate Teaching Fellowship Utah State University
2010	Undergraduate Research and Creative Opportunities Grant \$2,000
2008	Presidential Fellowship - 4 years Utah State University

Software Development

COSMIC – A PYTHON-INTERFACED BINARY POPULATION SYNTHESIS SUITE – ARXIV: 1911.00903

- Lead developer and maintainer of the code base
- Used in [152 papers](#) since release in 2020

LEGWORK – A SIGNAL TO NOISE CALCULATOR FOR LISA – ARXIV: 2111.08717

- Initiated the code base; mentored Tom Wagg (lead dev and maintainer)
- used in [45 papers](#) since release in 11/2021

COGSWORTH – A TOOL TO INTERFACE BINARY POPULATIONS AND GALACTIC DYNAMICS – ARXIV:2409.04543

- Initiated the code base; mentored Tom Wagg (lead dev and maintainer)
- Used in [7 papers](#) since release in 09/2024

METISSE – METHODS FOR INTERPOLATING SINGLE STAR EVOLUTION – 2025, JOSS, 10, 8817

- Collaborated with Poojan Agrawal (lead dev and maintainer) to connect with COSMIC
- Used in [4 papers](#) since release in 12/2025

BACKPOP – SAMPLING TOOL TO INVESTIGATE FORMATION OF OBSERVED INDIVIDUAL BINARIES

- Initiated the code base; mentoring Hannah Skobe as lead dev and maintainer
- Used in [4 papers](#) to date; release paper currently in prep

Grants and Observing Awards: \$2.06m total (\$1.13m to CMU) _____

- **A comprehensive view of the Milky Way's population of stellar-origin binaries | \$468.6k total – \$220k to CMU**
NASA LISA Preparatory Science | PI **Katie Breivik** w/ Co-I Kyle Kremer | 12/2025 – 11/2028
- **Near Field Population Synthesis | Collaborative grant w/ \$240.8k to CMU**
NSF Astronomy & Astrophysics | PI Carles Badenes with Co-I's **Katie Breivik** and Ben Williams | 09/2025 – 08/2027
- **One Step Back and Two Steps Forward: Understanding Gravitational Wave Progenitors by Leveraging Binary Stars in the Local Universe | Collaborative grant w/ \$391k to CMU**
NSF Astronomy & Astrophysics | PI **Katie Breivik** with Co-I Mathieu Renzo | 09/2025 – 08/2028
- **A Galaxy of Binaries: Evolving kicked populations through galactic potentials | \$544.8k total – \$68.4k to CMU**
NASA Astrophysics Theory Program, PI Eric Bellm with Co-I **Katie Breivik** | 01/2024 – 12/2026
- **The McWilliams Visitor Program | \$24k total**
McWilliams Center Seed Grant Program, PI **Katie Breivik** | 01/2024 – 05/2025
- **The Astrophysics of Ultra-compact White Dwarf Binaries: The Synergy of Gravitational Wave and Electromagnetic Observations | \$359.9k total – \$100.6k to CMU**
NASA LISA Preparatory Science, PI Tom Prince with Co-I **Katie Breivik** | 10/2025 – 09/2026
- **Chandra Observations of Helium Stars Stripped by Compact Objects | \$37.6k total**
Chandra Cycle 25, US Cost PI **Katie Breivik** with PI Bethany Ludwig | 11/2024 – 12/2026
- **Eclipsing: A Sound Walk**
Simons Foundation Triangle Program, PI Andrew Schneider with Co-I **Katie Breivik** | all funding supported sound walk production
- **Confirmation of the First Helium Star Stripped by a Black Hole | \$25k total**
Chandra Cycle 24, US Cost PI **Katie Breivik** with PI Bethany Ludwig | 07/2024 – 06/2026
- **Confirmation of the First Helium Star Stripped by a Black Hole | \$25.5k total**
Chandra Cycle 23, US Cost PI **Katie Breivik** with PI Bethany Ludwig | 06/2024 – 05/2026

Invited Seminars and Colloquia: 52 total _____

Apr 2027	University of Utah Astrophysics Seminar (scheduled)	Salt Lake City, UT
Feb 2026	Boston University Astrophysics Seminar	Boston, MA
Jan 2026	Columbia University Astronomy Colloquium	New York, NY
Oct 2025	Institute of Science and Technology ISTA Colloquium	Vienna, AUT
Sep 2025	University of Texas at Dallas Physics Colloquium	Dallas, TX
Apr 2025	University of Pittsburgh Astro Seminar	Pittsburgh, PA
Jan 2025	NASA Goddard Space Flight Center Astrophysics Science Division Colloquium	Greenbelt, MD
Dec 2024	University of Illinois Urbana Champaign Astronomy Colloquium	Champaign, IL
Sep 2024	West Virginia University Physics Colloquium	Morgantown, WV
May 2024	CITA CITA Seminar	Toronto, ON
May 2024	Oregon State University Physics Colloquium	Corvallis, OR
Apr 2024	Purdue University Astrophysics Seminar	West Lafayette, IN
Mar 2024	Cornell University Physics Colloquium	Ithaca, NY
Mar 2024	MIT Astrophysics Colloquium	Cambridge, MA
Nov 2023	UT Austin Weinberg Seminar: Binary evolution	Austin, TX
Oct 2023	UC Berkeley Theoretical Astrophysics Seminar	Berkeley, CA
Mar 2023	New York University Astrophysics and Relativity Seminar	New York, NY
Mar 2023	Harvard University ITC Colloquium	Cambridge, MA
Dec 2022	University of Zurich Gravitational Waves Seminar Series	Zurich, Switzerland
Nov 2022	Durham University FLAT Seminar	Durham, UK
Nov 2022	Cambridge University Institute of Astronomy Seminar	Cambridge, UK
Nov 2022	Las Cumbres Observatory LCO Seminar	Santa Barbara, CA
Oct 2022	Johns Hopkins University Theory Group Seminar	Baltimore, MD

Jun 2022	Pontificia Universidad Católica de Chile Colloquium	Santiago, Chile – virtual
Mar 2022	Michigan State University Astronomy Seminar	East Lansing, MI – virtual
Feb 2022	Caltech TAPIR Seminar	Pasadena, CA – virtual
Feb 2022	Queen Mary University London QMUL Seminar	London, UK – virtual
Feb 2022	AEI MPG Astrophysics & Cosmological Relativity Seminar	Potsdam, Germany – virtual
Jan 2022	Los Alamos National Lab Astrophysics Seminar	Los Alamos, NM – virtual
Jan 2022	Ohio State University Astronomy Colloquium	Columbus, OH – virtual
Nov 2021	University of Wisconsin Milwaukee CGCA Seminar	Milwaukee, WI – virtual
Nov 2021	Carnegie Mellon University Astro Seminar	Pittsburgh, PA – virtual
Apr 2021	Vanderbilt University Astro Seminar	Nashville, TN – virtual
Mar 2021	Texas Tech University Physics Colloquium	Lubbock, TX – virtual
Mar 2021	Carnegie Mellon University Astro Seminar	Pittsburgh, PA – virtual
Feb 2021	University of Oklahoma Astronomy Colloquium	Norman, OK – virtual
Dec 2020	CITA CITA Seminar	Toronto, ON – virtual
Nov 2020	University of British Columbia Astronomy Colloquium	Vancouver, BC – virtual
Oct 2020	Institute for Advanced Study Astronomy Seminar	Princeton, NJ – virtual
Dec 2019	Rochester Institute of Technology Astro Colloquium	Rochester, NY
Nov 2019	KICP - University of Chicago KICP Seminar	Chicago, IL
Oct 2019	Carnegie Observatories Astronomy Colloquium	Pasadena, CA
Oct 2019	University of Pittsburgh Astro Seminar	Pittsburg, PA
Apr 2019	MIT LIGO Lab LIGO Lab Seminar	Cambridge, MA
Apr 2019	CfA Harvard & Smithsonian Galaxies and Cosmology Seminar	Cambridge, MA
Feb 2019	TIFR TIFR DAA Special Seminar	Colaba, Mumbai, IN
Jun 2018	NASA GSFC Astrophysics Colloquium	Greenbelt, MA
Mar 2018	NASA MSFC Astrophysics Seminar	Huntsville, AL
Dec 2017	Caltech TAPIR Seminar	Pasadena, CA
Nov 2017	Columbia Astro Seminar	New York City, NY
Nov 2017	American Museum of Natural History Astro Seminar	New York City, NY
Jun 2017	UW Milwaukee CGCA Seminar	Milwaukee, WI

Invited Conference Presentations: 19 total

Mar 2026	APS Global Physics Summit Invited talk: Accessing the millihertz gravitational wave symphony with space-based missions	Denver, CO
Apr 2025	10 years to LISA Invited talk: LISA's role in understanding how binary black holes form	Pasadena, CA
Mar 2025	Stellar black hole formation and detection Invited talk: Sleeping giants: the dormant population of black holes and neutron stars in the Galaxy	Kyoto, JP
Mar 2025	Picture an Astronomer Invited talk: Binary stars: a decades-old problem with an open-science solution	Chicago, IL
Oct 2024	Challenges and future perspectives in GW astronomy Invited talk: Astrophysics with space-based GW detectors	Leiden, NL
Jul 2024	15th LISA Symposium Plenary talk: Stellar remnant populations for LISA	Dublin, IE
Jul 2024	Gravitational Wave Physics and Astronomy Workshop Plenary talk: The formation and evolution of stellar-origin GW sources	Birmingham, UK
May 2024	Hotwiring the Transient Universe Invited talk: Binary star progenitors to transient phenomena	Toronto, ON
Feb 2024	UNLV Multimessenger Meeting Invited talk: Astrophysics of compact objects	Las Vegas, NV
Jun 2023	MPA-Kavli Summer Program Invited talk: The role of rapid population synthesis in understanding binary evolution	Garching, DE
Jun 2023	Renaissance of black hole detections in the Local Group Invited talk: Predictions for dormant black holes from population synthesis	Leiden, NL

Apr 2023	APS April Meeting Invited talk; special session: LISA's role in time-domain and multi-messenger astronomy.	Minneapolis, MN
Oct 2022	KITP program: White Dwarfs Invited seminar: The formation and evolution of close double white dwarfs	Santa Barbara, CA
Jun 2021	24th CAPRA Meeting Invited plenary: Piecing together the formation properties and environments of compact objects in binaries	Perimeter Institute, virtual
May 2021	2021 Multiband Gravitational-Wave Science Workshop Invited talk: Piecing together the formation properties and environments of compact objects in binaries	Carnegie Mellon, virtual
Jul 2019	Beginnings and Ends of Double White Dwarfs Invited talk: Review of double white dwarf formation channels	DARK Institute, NBI
Feb 2019	Astrophysics with GW Populations Invited talk: Progenitors of GW populations	Aspen Center for Physics
Dec 2018	Future by the Future Workshop Invited talk: Constraints from space based gravitational wave detectors	Columbia University
Oct 2018	2nd COFI Workshop on GWs Invited talk: Astrophysics of interacting binaries with LISA and Gaia	COFI, Puerto Rico
Jan 2018	NASA GW SIG Meeting, 231st AAS Meeting Invited talk: Galactic binaries and LISA	National Harbor, MD

Contributed Conference Presentations: 15 total

Dec 2025	Foundation Models & Agentic Methods for Astrophysical Simulation AI-powered inference for binary evolution modeling	Pittsburgh, PA
Dec 2025	KITP program: Stellar-Mass Black Holes at the Nexus of Optical, X-ray, and Gravitational Wave Surveys Constraining stellar/binary evolution & compact object formation by comparing models to data	Santa Barbara, CA
Apr 2022	KITP program: Accretion and Orbital Evolution in Binaries The importance of open code in the astronomical ecosystem	Santa Barbara, CA
Jan 2019	AAS 233 Talk: Constraining compact object formation with 2M0521	Seattle, WA
Oct 2018	28th Midwest Relativity Meeting Talk: Formation and evolution of wide black hole binaries	Milwaukee, WI
Jun 2018	MODEST-18 Talk: LISA sources in globular clusters	Santorini, GR
Jan 2018	AAS 231 Dissertation talk: Simulating binary stars in the Milky Way	National Harbor, MD
Oct 2017	27th Midwest Relativity Meeting Talk: Discovering black hole binaries with Gaia	Ann Arbor, MI
Jul 2017	12th Edoardo Amaldi Conference on Gravitational Waves Talk: Astrophysics of accreting white dwarfs with LISA and Gaia	Pasadena, CA
Jan 2017	AAS 229 Poster: Distinguishing between formation channels for binary black holes with LISA	Grapevine, TX
Aug 2016	11th International LISA Symposium Poster: Distinguishing between formation channels for binary black holes with LISA	Zurich, SUI
Apr 2016	APS April Meeting Talk: Variance in binary stellar population synthesis	Salt Lake City, UT
Oct 2015	26th Midwest Relativity Meeting Talk: Variance in binary stellar population synthesis	Evanston, IL
Apr 2015	APS April Meeting Talk: Probing the Milky Way electron density using multi-messenger astronomy	Baltimore, MD
Jan 2015	AAS 225 Poster: Probing the Milky Way electron density using multi-messenger astronomy	Seattle, WA

Service, Outreach, and Engagement

Referee for ApJ, ApJL, MNRAS, A&A, JOSS, PRD, Nature Astronomy

Panel reviewer for NASA, NSF, Chandra, NASA NPP

Reviewer for the LISA Definition Study Report ('Red Book') – arXiv: 2402.07571

Conferences and Workshops

MODEST 27

SCIENCE ORGANIZING COMMITTEE

ICTP-SAIFR - Sao Paulo

Jul 2027

COSMO 25

SCIENCE/LOCAL ORGANIZING COMMITTEE

Carnegie Mellon University

Oct 2025

Stellar Black Hole Formation and Detection

SCIENCE ORGANIZING COMMITTEE

YITP - Kyoto

Mar 2025

International Workshop on AM CVn binaries – AM CVn 4.5

SCIENCE ORGANIZING COMMITTEE

Virtual

Aug 2022

Time domain and Multimessenger Astrophysics NASA Workshop

SCIENCE ORGANIZING COMMITTEE

Annapolis, MD

Aug 2022

Gaia DR3 Fête

LOCAL ORGANIZING COMMITTEE

NYC, NY

Jun 2022

From data to software to science with the Rubin observatory LSST

SCIENCE ORGANIZING COMMITTEE

NYC, NY

Mar 2022

NYC-wide SDSS-V and Gaia EDR3 Hack Sessions

CO-ORGANIZER

NYC, NY

Jun 2021 - Aug 2023

dotAstronomy TO

SCIENCE ORGANIZING COMMITTEE

Toronto, ON

Oct 2019

General Science Outreach and Education

I'm committed to sharing the work that I do with the public. I have interacted with ~2500 people at over 30 events across Pittsburgh, NYC, Toronto, Chicago, and Salt Lake City.

Full Publication List: 64 Total | h-index: 29

First author: 7

Population Synthesis of Gravitational Wave Sources

Breivik, K.

2025, *Encyclopedia for Astrophysics*

arXiv: 2502.03523

Constraining Galactic structure with the LISA white dwarf foreground

Breivik, K., MINGARELLI, C. M. F., LARSON, S. L.

2020, *ApJ*, 901, 4

arXiv: 1912.02200

COSMIC variance in binary population synthesis

Breivik, K., COUGHLIN, S., ZEVIN, M., ET AL.

2020, *ApJ*, 898, 71

arXiv: 1911.00903

Constraining black hole formation with 2M0521

Breivik, K., CHATTERJEE, S., ANDREWS, J. J.

2019, *ApJ*, 878, L4

arXiv:1810.08206

Characterizing double white dwarf binaries with LISA and Gaia

Breivik, K., KREMER, K., BUENO, M., LARSON, S. L., COUGHLIN, S., KALOGERA, V.

2018, *ApJ*, 854, L1

arXiv:1710.08370

Revealing black holes with Gaia

Breivik, K., CHATTERJEE, S., LARSON, S. L.

2017, *ApJ*, 850, L13

arXiv:1710.04657

Distinguishing between formation channels for binary black holes with LISA

Breivik, K., RODRIGUEZ, C. L., LARSON, S. L., KALOGERA, V., RASIO, F. A.

2016, *ApJ*, 830, L18

arXiv: 1606.0955

2nd/3rd author: 28; * indicates an advising role or co-first authorship

Charting the Galactic Underworld I: Comprehensive simulations of the kinematics, rates, and demographics of Milky Way black holes

*WAGG, T., BREIVIK, K., ET AL.

submitted to *ApJ*

arXiv:2607.22814

Twin Peaks: Resolving Features in the Binary Black Hole Mass Function with COSMIC-METISSE

*MACLEAN, D. B., AGRAWAL, P., BREIVIK, K., ET AL.

submitted to *ApJ*

arXiv:2606.28506

LISA's view of the Galactic Halo: forecasts for the Galactic double white dwarf population using Gaia data

*ALEXIS, A.-M., BREIVIK, K.

submitted to *ApJ*

arXiv:2607.09980

A Stellar Role Reversal: Multiple Features in the Mass and Mass Ratio Distributions of Merging Binary Black Holes from Stable Mass Transfer

*CHEN, G., BREIVIK, K., VAN SON, L. A. C.

accepted in *ApJ*

arXiv:2606.26262

The diverse outcomes of binary white dwarf mergers and connections to Galactic LISA sources

KREMER, K., BREIVIK, K., YE, C. S.

2026, *ApJ*, 1007, 171

arXiv:2605.05308

METISSE: METHod of Interpolation for Single Star Evolution

AGRAWAL, P., BREIVIK, K., HURLEY, J., RODRIGUEZ, C., STEVENSON, S., KEMP, A., SZÉCSI, D.

2025, *JOSS*, 10, 8817

arXiv:2605.05308

Properties of Core Collapse Supernovae from Binary Population Synthesis

*MARTINEZ, M., O'GRADY, A., BREIVIK, K., CHEN, G.

submitted to *ApJ*

arXiv:2511.23285

Where are Gaia's small black holes?

FISHBACH, M., BREIVIK, K., ET AL.

2026, *Ap&SS*, 371, 36

arXiv:2508.08986

Calibration of Binary Population Synthesis Models Using White Dwarf Binaries from APOGEE, GALEX and Gaia

*RUBIO, A. C., Breivik, K., ET AL.

2025, *A&A*, 704, A6

arXiv:2505.15893

Recovering Injected Astrophysics from the LISA Galactic Binaries

*DELFAVERO, V., Breivik, K., ET AL.

2025, *ApJ*, 981, 1

arXiv:2409.15230

cogsworth: A Gala of COSMIC proportions combining binary stellar evolution and galactic dynamics

*WAGG, T., Breivik, K., M. RENZO, A. PRICE-WHELAN

2025, *ApJS*, 276, 16

arXiv:2409.04543

The companion mass distribution of post common envelope hot subdwarf binaries: evidence for boosted and disrupted magnetic braking?	2024, <i>PASP</i> , 136, 124201
BLOMBERG, L., EL-BADRY, K. Breivik, K. , ET AL.	<i>arXiv:2408.15334</i>
Searching for binary black hole sub-populations in gravitational wave data using binned Gaussian processes	submitted to <i>ApJ</i>
RAY, A., MAGANA-HERNANDEZ, I., Breivik, K. , ET. AL.	<i>arXiv:2404.03166</i>
Cataclysmic variables are a key population of gravitational wave sources for LISA	2023, <i>MNRAS</i> , 525L, 50
SCARINGI, S., Breivik, K. , ET. AL.	<i>arXiv:2307.02553</i>
The Q Branch Cooling Anomaly Can Be Explained by Mergers of White Dwarfs and Subgiant Stars	2023, <i>ApJ</i> , 955, L33
SHEN, K., BLOUIN, S., Breivik, K.	<i>arXiv:2308.04559</i>
Backward Population Synthesis: Mapping the Evolutionary History of Gravitational-Wave Progenitors	2023, <i>ApJ</i> , 950, 181
*WONG, K. W. K., Breivik, K. , FARR, W. M., LUGER, R.	<i>arXiv:2206.04062</i>
Weighing the darkness II: Astrometric measurement of partial orbits with Gaia	2023, <i>ApJ</i> , 946, 111
ANDREWS, J. J., Breivik, K. , CHAWLA, C., CHATTERJEE, S., RODRIGUEZ, C.	<i>arXiv:2110.05549</i>
Applying the metallicity-dependent binary fraction to double white dwarf formation: Implications for LISA	2023, <i>ApJ</i> , 945, 162
*THIELE, S., Breivik, K. , SANDERSON, R. E., LUGER, R.	<i>arXiv:2111.13700</i>
LEGWORK: The LISA Evolution and Gravitational Wave Orbit Kit	2022, <i>JOSS</i> , 7, 70
*WAGG, T., Breivik, K. , DE MINK, S. E.	
LEGWORK: A python package for computing the evolution and detectability of stellar-origin gravitational-wave sources with space-based detectors	2022, <i>ApJS</i> , 260, 52
*WAGG, T., Breivik, K. , DE MINK, S. E.	<i>arXiv:2111.08717</i>
Gaia may detect hundreds of well-characterised stellar black holes	2022, <i>ApJ</i> , 931, 107
*CHAWLA, C., CHATTERJEE, S., Breivik, K. , ANDREWS, J. J., MOORTHY, C. K., SANDERSON, R. E.	<i>arXiv:2110.05979</i>
Joint constraints on the field-cluster mixing fraction, common envelope efficiency, and globular cluster radii from a population of binary hole mergers via deep learning	2021, <i>PRD</i> , 103, 8
*WONG, K. W. K., Breivik, K. , KREMER, K., CALLISTER, T.	<i>arXiv:2011.03564</i>
Weighing in on black hole binaries with BPASS: LB-1 does not contain a 70M_⊙ black hole	2020, <i>MNRAS</i> , 495, 3
ELDRIDGE, J. J., STANWAY, E. R., Breivik, K. , CASEY, A. R., STEEGHS, D. T. H., STEVANCE, H. F.	<i>arXiv:1912.03599</i>
Eclipses of continuous gravitational waves as a probe of stellar structure	2020, <i>PRD</i> , 101, 024039
MARCHANT, P., Breivik, K. , LARSON, S. L., MANDEL, I., BERRY, C. P. L.	<i>arXiv:1912.04268</i>
LISA and the existence of a fast-merging double neutron star formation channel	2020, <i>ApJ</i> , 892L, 9A
ANDREWS, J. J., Breivik, K. , PANKOW, C., D’ORAZIO, D. J., SAFARZADEH, M.	<i>arXiv:1910.13436</i>
Weighing the darkness: astrometric mass measurement of hidden stellar companions using Gaia	2019, <i>ApJ</i> , 886, 68
ANDREWS, J. J., Breivik, K. , CHATTERJEE, S.	<i>arXiv:1909.05606</i>
LISA sources in Milky Way globular clusters	2018, <i>PRL</i> , 120, 191103
KREMER, K., CHATTERJEE, S., Breivik, K. , RODRIGUEZ, C. L., LARSON, S. L., RASIO, F. A.	<i>arXiv:1802.05661</i>
Accreting double white dwarf binaries: implications for LISA	2017, <i>ApJ</i> , 846, 2
KREMER, K., Breivik, K. , LARSON, S. L., KALOGERA, V.	<i>arXiv:1707.01110</i>
<u>>= 4th author: 29</u>	
The host galaxies and merger environments of short and long gamma-ray bursts producing kilonovae	submitted to <i>ApJ</i>
SKOBE, H. ET AL.	<i>arXiv:2604.06586</i>

A Not-so-compact Companion: Massive, Oversized White Dwarf in a Post-common-envelope Eclipsing Binary	2026, <i>AJ</i> , 171, 159
MOTHERWAY, E. ET AL.	<i>arXiv:2601.14378</i>
Betelgeuse’s Buddy: X-Ray Constraints on the Nature of α Ori B	2025, <i>ApJ</i> , 992, 107
O’GRADY, T. ET AL.	<i>arXiv:2505.18376</i>
Betelgeuse, Betelgeuse, Betelgeuse, Betel-buddy? Constraints on the dynamical companion to α Orionis from HST	2025, <i>ApJ</i> , 994, 101
GOLDBERG, J. ET AL.	<i>arXiv:2505.18375</i>
Delayed and Displaced: The Impact of Binary Interactions on Core-collapse SN Feedback	2025, <i>AJ</i> , 170, 192
WAGG, T. ET AL.	<i>arXiv:2504.17903</i>
Stellar ejection velocities from the binary supernova scenario: A comparison across population synthesis codes	2025, <i>OJAp</i> , 8, 85
WAGG, T. ET AL.	<i>arXiv:2504.16161</i>
The Progenitor Systems of Classical Novae in M31	2025, <i>ApJ</i> , 984, 134
ABELSON, C. S. ET AL.	<i>arXiv:2501.04925</i>
Realistic Predictions for Gaia Black Hole Discoveries: Comparison of Isolated Binary and Dynamical Formation Models	2025, <i>PASP</i> , 137, 044202
NAGARAJAN, P. ET AL.	<i>arXiv:2502.03527</i>
Delayed Emission from Luminous Blue Optical Transients in Black Hole Binary Systems	2024, <i>ApJ</i> , 972L, 17L
LAZZATI, E. ET AL.	<i>arXiv:2403.18911</i>
Detecting Detached Black Hole binaries through Photometric Variability	submitted to <i>ApJ</i>
CHAWLA, C. ET AL. (INCL Breivik, K)	<i>arXiv:2310.16891</i>
Young Star Clusters Dominate the Production of Detached Black Hole-Star Binaries	2024, <i>ApJ</i> , 965, 22
DI CARLO, U. ET AL. (INCL Breivik, K)	<i>arXiv:2306.13121</i>
Many Roads Lead to Lithium: Formation Pathways For Lithium-Rich Red Giants	2024, <i>ApJ</i> , 964, 42
SAYEED, M. ET AL. (INCL Breivik, K)	<i>arXiv:2306.03323</i>
Investigating the Lower Mass Gap with Low Mass X-ray Binary Population Synthesis	2023, <i>ApJ</i> , 954, 212
SIEGEL, J. C, ET AL. (INCL Breivik, K)	<i>arXiv:2209.06844</i>
Astrophysics with the Laser Interferometer Space Antenna	2023, <i>Living Rev. Rel.</i> , 26, 2
AMARO SEOANE, P., ET AL. (INCL Breivik, K)	<i>arXiv:2203.06016</i>
A red giant orbiting a black hole	2023, <i>MNRAS</i> , 521, 4323
EL-BADRY, K., ET AL.	<i>arXiv:2302.07880</i>
TESS Giants Transiting Giants. III. An Eccentric Warm Jupiter Supports a Period-Eccentricity Relation for Giant Planets Transiting Evolved Stars	2023, <i>AJ</i> , 165, 44
GRUNBLATT, S. K., ET AL.	<i>arXiv:2210.17062</i>
A Sun-like star orbiting a black hole	2023, <i>MNRAS</i> , 518, 1057
EL-BADRY, K., ET AL.	<i>arXiv:2209.06833</i>
Rejuvenated accretors have less bound envelopes: Impact of Roche lobe overflow on subsequent common envelope events	2023, <i>ApJ</i> , 942L, 32
RENZO, M., ET AL.	<i>arXiv:2206.15338</i>
No Peaks without Valleys: The Stable Mass Transfer Channel for Gravitational-wave Sources in Light of the Neutron Star-Black Hole Mass Gap	2022, <i>ApJ</i> , 940, 184
VAN SON, L. A. C. ET AL.	<i>arXiv:2209.13609</i>
The effect of mission duration on LISA science objectives	2022, <i>GReGr</i> , 54, 3
AMARO SEOANE, P., ARCA SEDDA, M., BABAK, S., ET AL.	<i>arXiv:2107.09665</i>

Modeling dense star clusters in the Milky Way and beyond with the Cluster Monte Carlo code	2022, <i>ApJS</i> , 258, 2
RODRIGUEZ, C. L., WEATHERFORD, N. C., COUGHLIN, S. C., ET AL.	<i>arXiv:2106.02643</i>
Gravitational-Wave signatures from compact object binaries in the Galactic center	2021, <i>ApJ</i> , 917, 2
WANG, H., STEPHAN, A. P., NAOZ, S., HOANG, B., Breivik, K.	<i>arXiv:2010.15841</i>
GPU-accelerated periodic source identification in large-scale surveys: measuring P and $\dot{P}$	2021, <i>MNRAS</i> , 503, 2
KATZ, M. L., COOPER, O. R., COUGHLIN, M. W., Breivik, K. , LARSON, S. L.	<i>arXiv:2006.06866</i>
The missing link in gravitational-wave astronomy: Discoveries waiting in the decihertz range	2020, <i>CQG</i> , 37, 21
ARCA SEDDA, M., BERRY, C. P. L., JANI, K., ET AL.	<i>arXiv:1908.11375</i>
Stars stripped in binaries – the living gravitational wave sources	2020, <i>ApJ</i> , 904, 1
GOTBERG, Y., KOROL, V., LAMBERTS, A., ET AL.	<i>arXiv:2006.07382</i>
The fate of binaries in the Galactic center: the mundane and the exotic	2019, <i>ApJ</i> , 878, 58
STEPHAN, A. P., NAOZ, S., GHEZ, A. M., ET AL.	<i>arXiv:1903.00010</i>
Post-Newtonian dynamics in dense star clusters: BBHs in the LISA band	2019, <i>PRD</i> , 99, 063003
KREMER, K., RODRIGUEZ, C. L., AMARO-SEOANE, P., ET AL.	<i>arXiv:1802.05661</i>

Mentoring

Postdoctoral Fellows: 4

- **Anna O’Grady** – McWilliams Fellow (2023-2026)
- **Brendan O’Connor** – McWilliams Fellow (2023-2026)
- **Ignacio Magana Hernandez** – McWilliams Fellow (2023-2026)
- **Vera Delfavero** – NASA Postdoctoral Program Fellow (2022-2025); CITA Fellow (2025-2028)

Graduate Students: 8

- **Evelyn Allsup** – CMU (08/2025-now)
- **Hannah Skobe** – CMU (08/2023-now); NSF GRFP Honorable Mention
- **Ann-Marsha Alexis** – CMU (05/2023-now)
- **Gina Chen** – CMU (05/2023-now); NSF GRFP Honorable Mention
- **Amanda Rubio** – ESO/Universidade de Sao Paulo (05/2023-05/2025); *arXiv: 2505.15893*
- **Tom Wagg** – UW Seattle grad student (05/2020-05/2025); *arXiv: 2111.08717, 2409.04543, 2504.16161, arXiv:2504.17903*
- **Eesha Das Gupta** – U Toronto (05/2020 - 12/2024)
- **Chirag Chawla** – Tata Institute for Fundamental Research (02/2019 - 05/2025); *arXiv:2110.05979, 2310.16891*

Undergraduate Students at CMU: 14

- Past students: **Leon Gao** (grad @ Brown), **Will Ballard** (industry), **Reed Barmada** (PSC intern), **Runqiu Ye** (Amazon intern), **Jo Doyas**, **Sarah Pelesky** (LINCC intern)
- Current students: **Frank Prince** (SURF Fellow), **Mark Martinez** (NASA PA Space Grant Fellow), **Olivia Benvenuto** (SURA Student), **Rutong Pei** (SURF Fellow), **Ryan Zhang** (SURA Student), **Sydney Stratton** (SURA Student), **Luke Wilner** (SURA Student), **Mayur Kashyap** (SURA Student)

Undergraduate Students prior to CMU: 5

- **Maleah Rhem** (grad @ U Kansas; NSF GRFP Fellow), **Natalia Torres** (AstroCom NYC), **Maryam Esmat** (grad @ Johns Hopkins), **Sarah Thiele** (grad @ Princeton; *arXiv:2111.14700*), **Michael Bueno** (industry; *arXiv: 1710.08370*)

Teaching

Instructor

2023-now

CARNEGIE MELLON UNIVERSITY

- Astrophysics of Stars and The Galaxy: 33-467 (Fall 2023) | developed data-driven projects using public Gaia data
- Science and Science Fiction: 33-120 (Spring 2024, Fall 2024, Spring 2025, Spring 2026)

NSF GK-12 Graduate Teaching Fellow

2017-2018

NORTHWESTERN/LAKE VIEW HIGH SCHOOL

Created lesson plans on Kepler's Laws designed to bring computational thinking and current astrophysics research to high school classrooms.

Undergraduate Teaching Fellow

2009 - 2011

UTAH STATE UNIVERSITY

Aided in peer learning through real-world recitation questions for Introductory Physics for Physical Sciences course

Departmental Service

Co-director of the CMU Physics Teacher Program

4-DAY PROGRAM THAT CONNECTS PENNSYLVANIA HIGH SCHOOL PHYSICS TEACHERS TO CMU RESEARCHERS,
FULFILLS PENNSYLVANIA CONTINUING EDUCATION REQUIREMENTS

Summer 2025, 2026

Faculty advisor for CMU student organization

GENDER MINORITIES AND WOMEN IN PHYSICS

Aug 2025 - now

Astronomy PhD Committee

DEVELOPED COURSE PROPOSAL AND SYLLABUS FOR STARS AND BLACK HOLES COURSE

Aug 2024 - May 2025

Faculty advisor for McWilliams Center Journal Club

MAINTAIN SCHEDULE AND LEAD WEEKLY JOURNAL CLUB DISCUSSIONS

Fall 2024 - now

Director/Founder of the McWilliams Visitors Program

FACILITATE LONG-TERM COLLABORATION VISITS TO THE MCWILLIAMS CENTER

Fall 2023 - Spring 2025

McWilliams Fellowship Search Committee (Head 2023, 2024)

SELECT MCWILLIAMS FELLOWS IN ASTROPHYSICS AND COSMOLOGY

2022 - 2025

DEI Committee Member

WORKED ON DEVELOPMENT OF CODE OF CONDUCT AND CO-DEVELOPED TITLE IX PRESENTATION

Carnegie Mellon
Fall 2023-Spring 2025

UofT Astro-ph coffee & CITA Blackboard Seminar Organizer

ORGANIZED WEEKLY ALTERNATING JOURNAL CLUBS AND LUNCH TALKS

University of Toronto
Sep 2018 - Aug 2020

CIERA Astronomer Evenings

FOUNDER AND LEAD ORGANIZER

Dearborn Observatory
Jan 2016 - Aug 2018

Physics & Astronomy Graduate Student Council

ASTRONOMY OUTREACH COMMITTEE HEAD, EQUITY AND INCLUSION COMMITTEE MEMBER

Evanston, IL
Dec 2015 - May 2018