

Katelyn Breivik

Flatiron Institute -- Center for Computational Astrophysics

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Education

2018	Ph.D. in Physics and Astronomy Thesis: Simulating Binary Populations in the Milky Way	Northwestern University
2015	M.S. in Physics and Astronomy	Northwestern University
2012	B.S. in Physics with Professional Emphasis, Cum Laude	Utah State University

Research Experience

2020 - now	Flatiron Institute – Center for Computational Astrophysics Flatiron Research Fellow	New York City, NY
2018 - 2020	Canadian Institute for Theoretical Astrophysics Postdoctoral Fellow	Toronto, ON
2013 - 2018	Northwestern University Research Assistant	Evanston, IL

Honors & Awards

2019	Jeffrey L. Bishop Fellowship Bi-annually awarded to CITA postdoc: \$3, 000
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 Astronomy Achievement Award Honorable Mention, 229th AAS Meeting
2016	Northwestern Physics & Astronomy Rapid Fire Research 2nd Place
2014	Illinois Space Grant Consortium Graduate Fellowship Award Amount: \$10, 000
2010	Undergraduate Teaching Fellowship Utah State University
2010	Undergraduate Research and Creative Opportunities (URCO) Grant Award Amount: \$2, 000
2008	Presidential Fellowship - 4 years Utah State University

Selected Seminars/Colloquia: 19 Total, 4 Scheduled

Apr 2021	Vanderbilt University Astro Seminar	Nashville, TN – virtual
Mar 2021	Texas Tech University Colloquium	Lubbock, TX – virtual
Mar 2021	Carnegie Mellon University/University of Pittsburgh CMU/Pitt Astro Lunch	Pittsburgh, PA – virtual
Feb 2021	University of Oklahoma Colloquium	Norman, OK – virtual
Dec 2020	CITA CITA Seminar	Toronto, ON – virtual
Nov 2020	University of British Columbia Astronomy Colloquium	Vancouver, BC – 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 Colloquium	Pasadena, CA
Apr 2019	CfA Harvard & Smithsonian Galaxies and Cosmology Seminar	Cambridge, MA
Jun 2018	NASA GSFC Astrophysics Colloquium	Greenbelt, MA
Mar 2018	NASA MSFC Astrophysics Seminar	Huntsville, AL
Dec 2017	Caltech TAPIR Seminar	Pasadena, CA

Selected Conferences and Workshops: 4 Invited, 15 Contributed

July 2019	Beginnings and Ends of Double White Dwarfs Invited talk/workshop	DARK Institute, NBI
Dec 2018	Future by the Future Workshop Invited talk	Columbia University
Oct 2018	2nd COFI Workshop on GWs Invited talk	COFI, Puerto Rico
Jan 2018	The architecture of LISA Science Analysis: Imagining the Future Workshop participant	Keck Institute
Oct 2017	27th Midwest Relativity Meeting talk; Blue Apple award	Ann Arbor, MI
Jan 2017	AAS 229 Poster, Chambliss Honorable mention	Grapevine, TX

Membership and Leadership

Member of the American Astronomical Society (AAS) and the LISA Consortium

Mentoring

Maryam Esmat

CONSTRAINING THE GALACTIC ELECTRON DENSITY WITH MULTI-MESSENGER ASTRONOMY

Senior Thesis; Sep 2020 - now

Currently attending Lycoming College

Eesha Das Gupta; co-supervised with Maria Drout

EFFECTS OF RED SUPERGIANT WINDS ON BINARY POPULATIONS

Graduate research; May 2020 - now

Currently attending University of Toronto

Sarah Thiele

PREDICTING METALLICITY-DEPENDENT DOUBLE WHITE DWARF POPULATIONS OBSERVABLE BY LISA

UofT SURP; May 2020 - now

Currently attending UBC

Chirag Chawla; Co-supervised with Sourav Chatterjee

POPULATIONS OF COMPACT OBJECT + LUMINOUS COMPANION BINARIES OBSERVABLE BY GAIA

Graduate research; Feb 2019 - now

Currently attending TIFR Mumbai

Julianne Cronin; Co-supervised with Shane Larson

POPULATIONS OF OVER-CONTACT M DWARF BINARIES OBSERVABLE BY LISA

Undergrad research; 2017-2018

Currently attending Northwestern

Amia Ross

POPULATIONS OF DOUBLE NEUTRON STAR BINARIES OBSERVABLE BY LISA AND LIGO

High school intern; Summer 2017

Currently attending Harvard

Michael Bueno; Co-supervised with Shane Larson

POPULATIONS OF DOUBLE WHITE DWARF BINARIES OBSERVABLE BY LISA AND GAIA; ARXIV:1710.08370

REU student; Summer 2016

Currently attending Northwestern

Teaching Experience

Guest Lectures

UNIVERSITY OF TORONTO (ST GEORGE AND SCARBOROUGH CAMPUSES)

- Jun 19, 2019: GWs 101 (Summer undergrad research program Astro 101)
- Jan 29, 2019: Introduction to gravitational waves and their detection for upper division undergraduate laboratory course (PHYC 11H3)

NORTHWESTERN UNIVERSITY

- May 25, 2017: Introduction to gravitational waves for upper division undergraduate astronomy course (Astron 331)
- Nov 11, 2016: Overview of the atomic model for introductory, concept-based physics course (Phys 103)

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.

Graduate Teaching Assistant

2012 - 2013

UNIVERSITY OF GEORGIA

- Phys 1252: Introductory Physics for Engineers, Astr 1010: Introductory Astronomy

Undergraduate Teaching Assistant: General Physics and Astronomy Labs

2010 - 2012

UTAH STATE UNIVERSITY

- Phys 2110/2120: Introductory Physics for Life Sciences, Phys 1040: Introductory Astronomy, Observatory operator

Service, Outreach, and Engagement

Referee for ApJ, ApJL, MNRAS

dotAstronomy TO

Toronto, ON

SCIENCE ORGANIZING COMMITTEE

Oct 2019

UofT Astro-ph coffee

University of Toronto

CO-ORGANIZER

Sep 2018 - Aug 2020

CITA Blackboard Seminar

CITA

CO-ORGANIZER

Sep 2018 - Aug 2020

CIERA Astronomer Evenings

Dearborn Observatory

FOUNDER AND LEAD ORGANIZER 2016-2018; CURRENT ORGANIZER: EVE CHASE

Jan 2016 - Aug 2018

General Science Outreach and Education

I'M COMMITTED TO SHARING THE WORK THAT I DO WITH THE PUBLIC. I HAVE INTERACTED WITH OVER 2000 PEOPLE AT MORE THAN 25 EVENTS ACROSS THE TORONTO, CHICAGO, AND SALT LAKE CITY AREAS CAN PROVIDE A FULL LIST ON REQUEST.

2010-Present

Publications: 19 refereed/in review, 5 white papers

First author: 6

Constraining Galactic structure with the LISA white dwarf foreground

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

2020, *ApJ*, 901, 4

arXiv: 1912.02200

COSMIC variance in binary population synthesis

Breivik, K., COUGHLIN, S. C., ZEVIN, M. + 4 CO-AUTHORS

2020, *ApJ*, 898, 71B

arXiv: 1911.00903

Constraining black hole formation with 2M0521

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

2019, *ApJ*, 878L, 4

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*, 854L 1

arXiv:1710.08370

Revealing black holes with Gaia

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

2017, *ApJ*, 850L, 13

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*, 830L, 18

arXiv: 1606.0955

2nd/3rd author: 8

Weighing the darkness II: Astrometric Measurement of Partial Orbits with Gaia

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

under review in AAS Journals

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

WONG, K. W. K., Breivik, K., KREMER, K., CALLISTER, T.

under review in PRD

arXiv:2011.03564

Weighing in on black hole binaries with BPASS: LB-1 does not contain a 70M_⊙ black hole

ELDRIDGE, J. J., STANWAY, E. R., Breivik, K., CASEY, A. R., STEEGHS, D. T. H., STEVANCE, H. F.

2020, *MNRAS*, 495, 3

arXiv:1912.03599

Eclipses of continuous gravitational waves as a probe of stellar structure

MARCHANT, P., Breivik, K., LARSON, S. L., MANDEL, I., BERRY, C. P. L.

2020, *PRD*, 101, 024039

arXiv:1912.04268

LISA and the existence of a fast-merging double neutron star formation channel

ANDREWS, J. J., Breivik, K., PANKOW, C., D'ORAZIO, D. J., SAFARZADEH, M.

2020, *ApJ*, 892L, 9A

arXiv:1910.13436

Weighing the darkness: astrometric mass measurement of hidden stellar companions using Gaia

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

2019, *ApJ*, 886, 68

arXiv:1909.05606

LISA sources in Milky Way globular clusters

KREMER, K., CHATTERJEE, S., Breivik, K., RODRIGUEZ, C. L., LARSON, S. L., RASIO, F. A.

2018, *PRL*, 120, 191103

arXiv:1802.05661

Accreting double white dwarf binaries: implications for LISA

KREMER, K., Breivik, K., LARSON, S. L., KALOGERA, V.

2017, *ApJ*, 846, 2

arXiv:1707.0110

>= 4th author: 5

Gravitational-Wave signatures from compact object binaries in the Galactic center

WANG, H. STEPHAN, A. P. NAOZ, S. HOANG, B., Breivik, K.

submitted to ApJ

arXiv:2010.15841

Stars stripped in binaries – the living gravitational wave sources

GOTBERG, Y., KOROL, V., LAMBERTS, A., KUPFER, T., Breivik, K., LUDWIG, B., DROUT, M. R.

submitted to ApJ

arXiv:2006.07382

GPU-accelerated periodic source identification in large-scale surveys: measuring P and \dot{P}

KATZ, M. L., COOPER, O. R., COUGHLIN, M. W., Breivik, K., LARSON, S. L.

submitted to MNRAS

arXiv:2006.06866

The fate of binaries in the Galactic center: the mundane and the exotic

STEPHAN, A. P., NAOZ, S., GHEZ, A. MA., MORRIS, M. R., CIURLO, A., DO, T., Breivik, K. + 3 CO-AUTHORS

2019, *ApJ*, 878, 58

arXiv:1903.00010

Post-Newtonian dynamics in dense star clusters: BBHs in the LISA band

KREMER, K., RODRIGUEZ, C. L., AMARO-SEOANE, P., Breivik, K. + 7 CO-AUTHORS

2019, *PRD*, 99, 063003

arXiv:1802.05661

White papers: 5 total, 1 co-lead

The Missing Link in Gravitational-Wave Astronomy: Discoveries waiting in the decihertz range

ARCA SEDDA, M., ET AL. (INCL. Breivik, K.)

arxiv: 1908.11375

Populations of Black Holes in Binaries

MACCARONE, T. J., ET AL., (INCL **Breivik, K.**)

arxiv: 1904.11842

Gravitational Wave Survey of Galactic Ultra Compact Binaries

LITTENBERG, T. B., **Breivik, K.**, ET AL.

arxiv: 1903.05583

Stellar multiplicity: an interdisciplinary nexus

Breivik, K., PRICE-WHELAN, A. M., D'ORAZIO, D. J., HOGG, D. W. ET AL.

arxiv: 1903.05094

Multimessenger science opportunities with mHz gravitational waves

BAKER, J., ET AL. (INCL. **Breivik, K.**)

arxiv: 1903.04417