

# Katelyn Breivik

Canadian Institute for Theoretical Astrophysics

✉ kbreivik@cita.utoronto.ca | 🌐 katiebreivik.github.io

## Education

2018	<b>Ph.D. in Physics and Astronomy</b> Advisor: Shane L. Larson	Northwestern University
2015	<b>M.S. in Physics and Astronomy</b> Advisor: Shane L. Larson	Northwestern University
2012	<b>B.S. in Physics with Professional Emphasis, Cum Laude</b>	Utah State University

## Publications

<b>LISA sources in Milky Way globular clusters</b>	2018, <i>Phys. Rev. Lett.</i> 120, 191103
KREMER, K., CHATTERJEE, S., <b>Breivik, K.</b> , RODRIGUEZ, C., LARSON, S. L., RASIO, F. A.	arXiv:1802.05661
<b>Characterizing double white dwarf binaries with LISA and Gaia</b>	2018, <i>ApJ</i> , 854L 1B
<b>Breivik, K.</b> , KREMER, K., BUENO, M., LARSON, S. L., COUGHLIN, S. KALOGERA, V.	arXiv:1710.08370
<b>Revealing black holes with Gaia</b>	2017, <i>ApJ</i> , 850L, 13B
<b>Breivik, K.</b> , CHATTERJEE, S., LARSON, S. L.	arXiv:1710.04657
<b>Accreting double white dwarf binaries: implications for LISA</b>	2017, <i>ApJ</i> , 846, 2
KREMER, K., <b>Breivik, K.</b> , LARSON, S. L., KALOGERA, V.	arXiv:1707.0110
<b>Distinguishing between formation channels for binary black holes with LISA</b>	2016, <i>ApJ</i> , 830L, 18B
<b>Breivik, K.</b> , RODRIGUEZ, C. L., LARSON, S. L., KALOGERA, V., RASIO, F. A.	arXiv: 1606.0955

## Honors & Awards

2017	<b>Blue Apple Award</b> Best student talk at the 2017 Midwest Relativity Meeting
2017	<b>NSF GK-12 ‘Reach for the Stars’ Fellow</b> K-12 Teaching Fellowship
2017	<b>Chambliss Astronomy Achievement Award</b> Honorable Mention, 229th AAS Meeting
2016	<b>Northwestern Physics &amp; Astronomy Rapid Fire Research</b> 2nd Place
2014	<b>Illinois Space Grant Consortium Graduate Fellowship</b> Award Amount: \$10,000
2010	<b>Undergraduate Teaching Fellowship</b> Utah State University
2010	<b>Undergraduate Research and Creative Opportunities (URCO) Grant</b> Award Amount: \$2,000
2008	<b>Presidential Fellowship - 4 years</b> Utah State University

## Invited Talks and Workshops

<b>Exploring compact-binary astrophysics with multi-messenger astronomy</b>	Greenbelt, MD
ASTROPHYSICS SEMINAR AT NASA GSFC	Scheduled, June 5, 2018
<b>Exploring compact-binary astrophysics with multi-messenger astronomy</b>	Huntsville, AL
ASTROPHYSICS SEMINAR AT NASA MSFC	March 27, 2018
<b>COSMIC probes into compact binary formation and evolution</b>	National Harbor, MD
NASA GW SIG MEETING, 231ST AAS MEETING	January 8, 2018
<b>The Architecture of LISA Science Analysis: Imagining the Future</b>	Pasadena, CA
WORKSHOP AT W. M. KECK INSTITUTE FOR SPACE STUDIES	January 16-19, 2018
<b>Exploring compact binary astrophysics with multi-messenger astronomy</b>	Pasadena, CA
TAPIR SEMINAR AT CALTECH	December 1, 2017
<b>Exploring compact binary astrophysics with multi-messenger astronomy</b>	New York City, NY
ASTRO SEMINAR AT COLUMBIA	November 16, 2017
<b>Exploring compact binary astrophysics with multi-messenger astronomy</b>	New York City, NY
ASTRO SEMINAR AT AMNH	November 14, 2017
<b>Exploring stellar-mass compact binary astrophysics with LISA</b>	Milwaukee, WI
CGCA SEMINAR AT UW MILWAUKEE	June 2, 2017

## Contributed Presentations

## COSMIC probes into compact binary formation and Evolution

DISSERTATION TALK AT THE 231ST MEETING OF THE AAS

### Revealing the Milky Way's black hole population with Gaia

TALK AT 27TH MIDWEST RELATIVITY MEETING

### Observing Mass-Transfer in Double White Dwarfs with LISA and Gaia

TALK AT 12TH EDOARDO AMALDI CONFERENCE ON GRAVITATIONAL WAVES

### Distinguishing Between Formation Channels for Binary Black Holes with LISA

POSTER SESSION AT 229TH MEETING OF THE AAS

### Distinguishing Between Formation Channels for Binary Black Holes with LISA

POSTER SESSION AT 11TH INTERNATIONAL LISA SYMPOSIUM

### Variance in binary stellar population synthesis

TALK AT APS APRIL MEETING

### Exploring galactic binary population variance with population synthesis

TALK AT MIDWEST RELATIVITY MEETING

### Probing the Milky Way electron density using multi-messenger astronomy

TALK AT APS APRIL MEETING

### Rapid Monte Carlo Simulation of Gravitational Wave Galaxies

POSTER SESSION AT 225TH MEETING OF THE AAS

### Background Sky Variability for Multi-Messenger Follow-up Surveys

POSTER SESSION AT 219TH MEETING OF THE AAS

National Harbor, MD

Jan. 2017

Ann Arbor, MI

Oct 2017

Pasadena, CA

July 2017

Grapevine, TX

Jan. 2017

Zurich, SWI

Aug. 2016

Salt Lake City, UT

April 2016

Evanston, IL

Oct. 2015

Baltimore, MD

April 2015

Seattle, WA

Jan. 2015

Austin, TX

Jan. 2012

## Mentoring

### Julianne Cronin

SIMULATING POPULATIONS OF OVER-CONTACT M DWARF BINARIES OBSERVABLE BY LISA

Undergraduate researcher; Present

Current student at Northwestern

### Amia Ross

SIMULATING POPULATIONS OF DOUBLE NEUTRON STAR BINARIES OBSERVABLE BY LISA AND LIGO

High school intern; Summer 2017

Attending Harvard in Fall 2018

### Michael Bueno

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

REU student; Summer 2016

Attending Northwestern in Fall 2018

## Service and Outreach

### Referee for ApJ, ApJ Letters

### CIERA Astronomer Evenings

FOUNDER AND LEAD ORGANIZER

Dearborn Observatory

Jan. 2016 - PRESENT

### Astronomy on Tap - Chicago

FOUNDING MEMBER AND PRESENTER

Chicagoland area, IL

March 2016 - PRESENT

### Astronomy Conversations

MONTHLY VISIT TO ADLER'S SPACE VISUALIZATION LAB FOR CONVERSATIONS WITH PLANETARIUM VISITORS

Adler Planetarium

March 2016 - PRESENT

### General Science Outreach and Education

PARTICIPANT

2010-Present

- I'm committed to sharing the work that I do with the public and have interacted with over 1500 people at more than 15 events across the Greater Chicagoland and Salt Lake City areas; I'm happy to provide more details on request

## Experience

### RESEARCH

#### Graduate Research Assistant

CIERA, NORTHWESTERN UNIVERSITY

Evanston, IL

June 2013 - Present

- Monte Carlo simulations of compact binary populations
- Predicting gravitational wave source catalogs for LISA

#### Undergraduate Research Assistant

UTAH STATE UNIVERSITY

Logan, UT

Aug 2010 - June 2012

- Characterizing sky brightness fluctuations for optical follow up of gravitational wave events
- Observation the precession of the inner Jovian moons as a probe of general relativity

## TEACHING

### NSF GK-12 Graduate Teaching Fellow

NORTHWESTERN/LAKE VIEW HIGH SCHOOL

Creating lesson plans designed to bring computational thinking to an astronomy class at Chicago's oldest public high school.

Chicago, IL

2017-2018

### Guest Lectures

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)

Evanston, IL

2016-2017

### Graduate Teaching Assistant

UNIVERSITY OF GEORGIA

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

Athens, GA

Aug. 2012 - May 2013

### Undergraduate Teaching Assistant: General Physics and Astronomy Labs

UTAH STATE UNIVERSITY

- Phys 2110/2120: Introductory Physics for Life Sciences
- Phys 1040: Introductory Astronomy
- Observatory operator and lab facilitator

Logan, UT

Aug. 2010 - Jan. 2012

## References

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### Shane L. Larson

CIERA/PHYSICS AND ASTRONOMY

NORTHWESTERN UNIVERSITY

[shane.larson@northwestern.edu](mailto:shane.larson@northwestern.edu)

### Vicky Kalogera

CIERA/PHYSICS AND ASTRONOMY

NORTHWESTERN UNIVERSITY

[vicky@northwestern.edu](mailto:vicky@northwestern.edu)

### Jeffery C. Livas

GRAVITATIONAL ASTROPHYSICS LAB

NASA/GSFC

[jeffrey.livas-1@nasa.gov](mailto:jeffrey.livas-1@nasa.gov)