

LILLY BRALTS-KELLY

Astrophysicist by training with a passion
for science communication and outreach.

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EDUCATION

Macalester College

B.A. Physics (Astronomy), Mathematics
Cumulative GPA: 3.99/4.00

August 2016 – May 2020 (expected)

RESEARCH EXPERIENCE

Summer Student

Summer 2019

Netherlands Institute for Radio Astronomy (ASTRON), Dwingeloo, The Netherlands

- ◇ Imaged VLA HI observations of ultra-compact high-velocity clouds using CASA
- ◇ Modeled the kinematics of these candidate galaxies using pyBBarolo
- ◇ Advised by Dr. Betsey Adams

NSF REU Student

Summer 2018

University of Michigan, Ann Arbor, MI

- ◇ Simulated the effects of cosmic ray showers on a liquid scintillator neutrino experiment
- ◇ All analysis code was written in C++ and made use of several preexisting particle detector libraries
- ◇ Advised by Dr. Joshua Spitz

Research Assistant

Spring 2017, Spring 2018

Macalester College, St. Paul, MN

- ◇ Analyzed HI spectroscopy for the Arecibo Pisces-Perseus Supercluster Survey
- ◇ Imaged VLA neutral hydrogen observations of local volume dwarf galaxies using CASA
- ◇ Advised by Dr. John Cannon

NSF REU Student

Summer 2017

Montana State University, Bozeman, MT

- ◇ Imaged and analyzed X-ray and ultraviolet signatures of magnetic reconnection in solar flare events
- ◇ Used data from NASA/RHESSI, SDO/AIA, and SDO/HMI solar observation instruments
- ◇ All analysis code was written in IDL
- ◇ Advised by Dr. Jiong Qiu

REFEREED PUBLICATIONS

- [2] "Delayed Stellar Mass Assembly in the Low Surface Brightness Dwarf Galaxy KDG215."
Cannon, J. M., Shen, Z., McQuinn, K. B. W., Bartz, J., **Bralts-Kelly, L.**, et al.
Astrophysical Journal Letters, 2018, 864, L14. [arXiv:1808.07108](https://arxiv.org/abs/1808.07108)
- [1] "First Characterization of the Neutral ISM in Two Local Volume Dwarf Galaxies."
Bralts-Kelly, L., Bulatek, A. M., Chinski, S., et al.
Astrophysical Journal Letters, 2017, 848, L10. [arXiv:1709.10161](https://arxiv.org/abs/1709.10161)

POSTERS AND PRESENTATIONS

- [6] "HI Imaging and Analysis of Candidate Satellite Dwarf Galaxies."
Oral presentation: **Bralts-Kelly, L.** 2019, ASTRON/JIVE AstroLunch.
- [5] "Delayed Stellar Mass Assembly in the Low Surface Brightness Dwarf Galaxy KDG 215."
Poster: **Bralts-Kelly, L.**, et al. 2019, 233rd Meeting of the American Astronomical Society/AAS#233.

- [4] "Simulating the Cosmic Ray Background for a Liquid Scintillator Neutrino Experiment."
Poster: **Bralts-Kelly, L.**, Spitz, J, & Jordan, J. 2018, Macalester College Student Research Showcase.
- [3] "Modeling Cosmic Rays for a Liquid Scintillator Neutrino Experiment."
Oral presentation: **Bralts-Kelly, L.** 2018, University of Michigan REU Symposium.
- [2] "Spatial and Spectral Evolution of Solar Flares in the HXR and Ultraviolet."
Poster: **Bralts-Kelly, L.**, & Qiu, J. 2017, Macalester College Student Research Showcase.
- [1] "HXR Spatial and Spectral Evolution of Solar Flares."
Oral presentation: **Bralts-Kelly, L.** 2017, Montana State University Solar Physics REU.

ACADEMIC EMPLOYMENT

Physics Tutor Fall 2017 – present

Macalester College, St. Paul, MN

- ◇ Assists with problem sets, lab preparation, and exam review for introductory physics classes

Public Observing Nights Coordinator Fall 2018 – present

Macalester College, St. Paul, MN

- ◇ Operates Macalester's own 16-inch telescope for the Minneapolis/St. Paul public
- ◇ Answers questions and gives talks on the telescope, the cosmos, and astronomy at Macalester

Physics & Astronomy Grader

Macalester College, St. Paul, MN

- ◇ Assigns grades, provides feedback, and holds regular office hours
 - ◆ PHYS 481: Quantum Mechanics Fall 2019
 - ◆ PHYS 348: Laboratory Instrumentation Spring 2019
 - ◆ PHYS 113: Modern Astronomy I Spring 2018
 - ◆ PHYS 227: Principles of Physics II Fall 2017

Mathematics Preceptor

Macalester College, St. Paul, MN

- ◇ Assigned grades, provided feedback, and held regular office hours
 - ◆ MATH 312: Differential Equations Spring 2018

PROFESSIONAL DEVELOPMENT

Undergraduate Research Mentor Fall 2019 – present

Macalester College, St. Paul, MN

- ◇ Advises a younger undergraduate student on involvement in research
- ◇ Student is contributing data reduction efforts to a paper currently in prep.

Women in Physics & Astronomy Reading Group Fall 2019 – present

Macalester College, St. Paul, MN

- ◇ Assists with curriculum development for a related course to be offered at Macalester in the future

La Serena School for Data Science Summer 2018

Associated Universities for Research in Astronomy, Inc., La Serena, Chile

- ◇ Attended an intensive ten-day school on data handling in astronomical and biological environments
- ◇ Hosted at the Gemini South Observatory complex in La Serena

EXTRACURRICULAR ACTIVITIES

Class of 2020 Representative Fall 2018 – present

High Power Rocketry at Macalester

- ◇ Assists with financial and logistical planning for outreach events and competitions
- ◇ Specializes in CAD implementation and machining for competitive rockets
- ◇ Team member since 2017

Assistant Chief Operator

Fall 2018 – present

WMCN 91.7 FM (Macalester College Radio)

- ◇ Performs weekly and monthly checks on the performance of the transmitter system
- ◇ Records weekly and monthly Emergency Alert System notifications per regulations set in place by the Federal Communications Commission

President

Fall 2018 – Spring 2019

Macalester Physics & Astronomy Club/Society of Physics Students

- ◇ Arranged for free membership in the Society of Physics Students for all interested students, sponsored by the Macalester Department of Physics & Astronomy
- ◇ Began logistical planning to bring a speaker to campus on the topics of diversity and inclusion in physics
- ◇ Treasurer for academic year 2017/18

PROFESSIONAL SOCIETY MEMBERSHIPS

American Astronomical Society (AAS)

Fall 2018 – present

American Physical Society (APS)

Fall 2018 – present

Society of Physics Students (SPS)

Fall 2018 – present

HONORS AND AWARDS

Dean's List

All semesters

Macalester College

DeWitt Wallace Distinguished Scholarship

2016 – 2020

Macalester College

National Merit Scholarship

2016 – 2020

Macalester College

Dr. Russell B. Hastings Endowed Scholarship

2017 – 2020

Macalester College

La Serena School for Data Science Scholarship

2018

Associated Universities for Research in Astronomy, Inc.

Undergraduate Scholarship

2017 – 2018

NASA's Minnesota Space Grant Consortium

TECHNICAL SKILLS

Bolded text indicates a high level of competence.

Python

C++

LabVIEW

Excel

R

MATLAB

CASA

LaTeX

IDL

Mathematica

IRAF