

# Catherine Slaughter

PhD Program Applicant

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## Education

2017–2021 **BA in Astronomy and Physics**, Dartmouth College, Hanover, NH.

GPA: 3.52 overall, 3.75 in Astronomy Major (updated to reflect Fall 2020 Grades)

Expected to graduate in June 2021. Studied abroad and participated in an observing run at SAAO in South Africa Jan-Mar 2019.

Senior Honors Thesis: *Refining the Age of the Universe Using Globular Clusters*

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## Extracurricular Research Experience

2020–Present **Senior Thesis Project**, Dartmouth College Dept. of Physics and Astronomy, Chaboyer Group, Hanover, NH.

Implemented numerical analysis method from Dolphin 2001 along with Monte Carlo Main-Sequence fitting as done in O'Malley et al. 2017 to determine the ages of several nearby globular clusters with significantly decreased error. Doing so sets a hard lower limit for the age of the universe, potentially helpful for future research in the Hubble Tension.

◦ Related Publications: *Refining the Age of the Universe with Globular Clusters* in preparation

2020–Present **Caltech Summer Undergraduate Research Fellowship**, California Institute of Technology, Harrison Group, Pasadena, CA.

Analyzed previously unused stray-light observations from NuSTAR of several low-mass neutron star x-ray binaries. Began as a Summer project, but work continued into the school year for extracurricular interest. Research conducted remotely due to COVID-19 pandemic.

◦ Final Report: *Analyzing Straylight X-ray Binaries with NuSTAR*

◦ Related Publications: *A Straylight Analysis of NS LMXB GX17+2* in preparation

*StrayCats: A catalog of NuSTAR Stray Light Observations* submitted for publication

2018–2019 **Undergraduate Researcher**, Dartmouth College Dept. of Physics and Astronomy, Chaboyer Group, Hanover, NH.

Worked calibrating DSED stellar evolution models against certain metal-poor subdwarfs.

◦ Related Publications: *Metal-Poor Calibrating Subdwarfs in the Gaia Era* submitted for publication July 2020

◦ Analyzed spectral data and measured emission line equivalent widths in splot

◦ Created model atmospheres using MOOG program

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## Publications

Christina Gilligan et al. Metal-Poor Calibrating Subdwarfs in the Gaia Era. *Submitted for Publication*, 2020.

Brian Grefenstette et al. Straycats: A Catalog of NuSTAR Stray Light Observations. *Submitted for Publication*, 2020.

Catherine M. Slaughter and Brian Chaboyer. Refining the Age of the Universe Using Globular Clusters. *In Preparation*, 2021.

Catherine M. Slaughter, R.M. Ludlam, and Brian Grefenstette. A Straylight Analysis of NS LMXB GX17+2. *In Preparation*, 2021.

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## Honors and Awards

Nov 2019 **Francis L. Town Scientific Prize (Physics and Astronomy)**, Dartmouth College.

A prize offered annually to "one meritorious and deserving student in each department of scientific study at the College" at the end of Sophomore year.

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## Poster Presentations

- August 2020 **Caltech SFP Symposium**, Pasadena, CA.  
"Analyzing Straylight X-ray Binaries with NuSTAR"  
Presented electronically due to COVID-19
- May 2020 **Wilder Department Symposium**, Hanover, NH.  
"Refining the Age of the Universe Using Globular Clusters: Prerequisite Work"  
Presented electronically due to COVID-19 Pandemic
- May 2018 **Wetterhan Science Symposium**, Hanover, NH.  
"Improving Metal-Poor Stellar Evolution Models"

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## Grants

- Summer 2020 **Caltech SURF Grant**, \$6620.  
Awarded to Caltech Summer Undergraduate Research Fellows.
- Spring 2019 **Dartmouth College Undergraduate Leave Term Grant**, \$5200.  
Grant awarded to students conducting a term of full-time research.
- 2018–2019 **Dartmouth College Sophomore Research Scholar**, \$2000.  
Grant awarded to second-year students assisting faculty in their research.

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## Teaching Experience

- 2019–Present **Dartmouth Emerging Engineers Tutor**, *Thayer School of Engineering*, Part-Time, Hanover, NH.  
Tutor for first-year students taking introductory math, physics, and computer science courses.
- 2018–Present **Public Observing Guide**, *Dartmouth College Dept. of Physics and Astronomy*, Part-Time, Hanover, NH.
- Summer 2019, Spring 2020 **Introductory Astronomy Teaching Assistant**, *Dartmouth College Dept. of Physics and Astronomy*, Part-Time, Hanover, NH.  
Teaching assistant for an introductory astronomy course geared toward arts and humanities students.
- Summer 2018 **Astronomy and Nature Guide**, *Carthage College in collaboration with the Appalachian Mountain Club*, Full-Time, Crawford Notch, NH.  
Worked with the general public in order to educate about astronomy, spread awareness for environmental issues, and encourage certain social changes.

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## Skills

Programming	C, JAVA, MATLAB, PYTHON (PYRAF), VHDL, BASH HTML, CSS, FORTRAN	<i>Intermediate</i> <i>Beginner</i>
Computer	Terminal interface, L <sup>A</sup> T <sub>E</sub> X, DS9, MOOG, XSPEC, Anaconda	
Language	English Spanish	<i>First Language</i> <i>Conversational</i>