Catherine Slaughter, M.Sc.

Astronomer

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CatieSlaughts

Education

2023–Present **Ph.D. Astrophysics**, *The University of Minnesota*, Minneapolis, MN.

2021–2023 **M.Sc. Astronomy Research**, *Leiden University*, Leiden, Netherlands.
Average Grade: *8.04/10*
US Equivalent GPA: *3.92/4.0*
- First-Year Thesis: *A Modeled Radiation Field Search for Bubble Structures in the Greater Orion Nebula*
- Master's Thesis: *Disentangling the Shadows of a Planetary Collision*

2017–2021 **B.A. Astronomy and Physics**, *Dartmouth College*, Hanover, NH.
GPA: *3.54/4.00*
Studied abroad at SAAO in South Africa Jan-Mar 2019.

Research Experience

2022–2023 **Master's Thesis Project**, *Leiden Observatory*, Kenworthy Group, Leiden, NL.
Disentangling the Shadows of a Planetary Collision Around ASASSN-21qj. Modeled planetesimal collision remnants and their resulting transit light curves in Python. Fit modeled light curves to real data of the ASASSN-21qj system to better study the geometry of an expected real-life planetary collision. Such collisions are important to our understanding of planet system formation. While we have few observations of them, we expect to observe more with LSST.

2021–2022 **First Year Master's Project**, *Leiden Observatory*, Tielens Group, Leiden, NL.
A Modeled Radiation Field Search for Bubble Structures in the Greater Orion Nebula Region. Used SOFIA and Herschel data, along with a new radiation-field modeling code to develop a method for searching for kinematic structures in gas clouds based on expected local radiation field contribution. Additionally identified a possible previously unreported fossil bubble structure in Orion Molecular Cloud A.

2020–2021 **Undergraduate Culminating Research Project.**, *Dartmouth College Dept. of Physics and Astronomy*, Chaboyer Group, Hanover, NH.
Refining the Age of the Universe with Globular Clusters. Implemented new numerical analysis methods along with Monte Carlo Main-Sequence fitting 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.

2020–2021 **Caltech SURF**, *California Institute of Technology*, Harrison Group, Pasadena, CA.
Analyzing Straylight X-ray Binaries with NuSTAR. Analyzed previously unused stray-light observations from NuSTAR of several low-mass neutron star x-ray binaries.

2018–2019 **Undergraduate Researcher**, *Dartmouth College Dept. of Physics and Astronomy*, Chaboyer Group, Hanover, NH.
Improving Metal-Poor Stellar Evolution Models. Calibrated stellar evolution models against certain metal-poor subdwarfs. Analyzed spectral data and measured emission line equivalent widths in SPLOT. Created model atmospheres using MOOG.

Publications

Jiaqi Yang et al. The Absolute Age of M92. *Accepted to AJ*, 2023.

Brian Grefenstette et al. StrayCats: A Catalog of NuSTAR Stray Light Observations. *ApJ*, 2021.

Poster Presentations and Colloquia

Jun 2023 **Leiden Observatory Master's Colloquium**, Leiden, NL, Talk.
"Disentangling the Shadows of a Planetary Collision"

Jan 2023 **AAS Annual Meeting**, Seattle, WA, Poster.
"A Modeled Radiation Field Search for Feedback Structures in the Greater Orion Nebula Region"

Aug 2020 **Caltech SFP Symposium**, Pasadena, CA, Poster.
"Analyzing Straylight X-ray Binaries with NuSTAR"

May 2020 **Wilder Department Symposium**, Hanover, NH, Poster.
"Refining the Age of the Universe Using Globular Clusters: Prerequisite Work"

May 2018 **Wetterhan Science Symposium**, Hanover, NH, Poster.
"Improving Metal-Poor Stellar Evolution Models"

Honors and Awards

Nov 2022 **AAS FAMOUS Grant**, $1000.
Travel grant awarded to an early-career astronomer to attend a single AAS meeting, at which the awardee will present her or his research.

Jun 2021 **James B. Reynolds Scholarship for Foreign Study**, $25,000.
Fellowship awarded to recent Dartmouth graduates pursuing long-term research or study outside the United States.

Jun 2020 **Caltech SURF Grant**, $6620.
Awarded to Caltech Summer Undergraduate Research Fellows.

Mar 2019 **Dartmouth College Undergraduate Leave Term Grant**, $5200.
Competitive grant awarded to students conducting a term of full-time research.

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

Sep 2018 **Dartmouth College Sophomore Research Scholar**, $2000.
Competitive grant awarded to second-year students assisting faculty in their research.

Jan 2018 **Women in Science Project Fellowship**.
Funding for first-year undergraduate women at Dartmouth College to engage in research in the sciences.

Teaching and Outreach Experience

Summer 2022 **Astronomer-in-Residence**, *CIDSR and Boise State University*, Part-Time, Central Idaho.
Traveled around the Central Idaho Dark Sky Reserve (with particular focus on the towns of Stanley, Ketchum/Sun Valley, and Hailey) for various public outreach and engagement events. Duties included public observing, lecturing, mentoring undergraduate students in outreach, and curriculum development.

2018–2021 **Public Observing Guide**, *Dartmouth College Dept. of Physics and Astronomy*, Part-Time, Hanover, NH.
Designed and Lead weekly PO programs serving Dartmouth College and the greater community in the Upper Valley. Duties included nighttime lecturing, target selection, and telescope setup and operation.

2019–2021 **Dartmouth Emerging Engineers Tutor**, *Thayer School of Engineering*, Part-Time, Hanover, NH.
Tutored first-year students taking introductory math, physics, and computer science courses. The DEE program especially targets first-gen and low-income students for peer support and mentoring.

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. Duties included conducting lab sessions, grading, and general student support.

Summer 2018 **Astronomy and Nature Guide**, *Mountains of Stars*, Full-Time, Crawford Notch, NH.
Worked with the general public in order to educate about astronomy, spread awareness for environmental issues, and encourage widespread social change. Duties included lecturing, target selection, telescope setup and operation, tabletop demonstrations, planetarium shows, and social media management.

Relevant Extracurriculars

2022-Present **VAST Organizing Committee**, *Virtual Astronomy Software Talks*, Volunteer.
Assists in the planning, organization, and presentation of *VAST* seminars. Primary role includes establishing connections across continents and fields, monitoring audience questions, and general planning.

Skills

Programming	Python, MATLAB, C, C++, Fortran, Java, Bash, VHDL	*Experienced*
	CSS, HTML	*Beginner*
Software	AMUSE, Conda, DS9, LaTeX, Linux/OSX Terminal, MOOG, PyRAF, XSPEC	
Technical	Data Analysis and Visualization, Telescope Operation and Maintenance	
Languages	English	*Native Speaker*
	Spanish	*Conversational*
Other	Social Media Management, Science Communication, Written and Oral Communication	