Catherine Slaughter

Early-Career Astronomer

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Education

2021–2023 **MSc in Astronomy Research**, *Leiden University*, Leiden, Netherlands.
Average Grade: *8.0/10*
US Equivalent* GPA: *4.0/4.0*
Expected to defend and graduate June 2023
**Individual course grades are converted based on Nuffic standards (as directed by Leiden University), then GPA is calculated as usual. Full calculation can be found in this Google Sheet.*

2017–2021 **BA in Astronomy and Physics**, *Dartmouth College*, Hanover, NH.
GPA: *3.54/4.00*
Class of 2021. Studied abroad and participated in an observing run at SAAO in South Africa Jan-Mar 2019.
Culminating Research Work: *Refining the Age of the Universe Using Globular Clusters*

Research Experience

2021–Present **First Year MSc Project**, *Leiden Observatory*, Tielens Group, Leiden, NL.
Using Gaia EDR3 and SOFIA IR data to further analyze and probe the barriers to and drivers of star formation in the veil region surrounding θ_1 Ori C in the Orion Nebula.
Final Grade: *–/10*

2020–2021 **Refining the Age of the Universe with Globular Clusters**, *Dartmouth College Dept. of Physics and Astronomy*, Chaboyer Group, Hanover, NH.
Undergraduate culminating Research Project. Implemented new numerical analysis methods 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

2020–2021 **Caltech SURF: Analyzing Straylight X-ray Binaries with NuSTAR**, *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: *StrayCats: A catalog of NuSTAR Stray Light Observations, 2021*

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* in preparation
- Analyzed spectral data and measured emission line equivalent widths in splot
- Created model atmospheres using MOOG program

Publications

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

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

Christina Gilligan et al. Metal-Poor Calibrating Subdwarfs in the Gaia Era. *In Preparation*, 2021.

Poster Presentations

Aug 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"

Grants & Fellowships

2021-2022 **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.

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.

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.

Teaching and Outreach Experience

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. Nightly duties included lecturing, target selection, and telescope setup and operation. Daytime duties included tabletop demonstrations, planetarium shows, and summer camp group activities.

Relevant Extracurriculars

2022-Present **Inclusive Astronomy**, *Sterrewacht Leiden*, Committee Member.
Leiden Observatory's Equity, Diversity and Inclusion Committee. A group of 12 volunteers ranging from MSc students to administrative and senior academic staff who work to implement EDI policies and make structural and cultural changes at the Observatory.

Skills

Programming Bash, C, C++, Fortran, Java, MATLAB, Python, VHDL *Experienced*
CSS, HTML *Beginner*

Software AMUSE, Conda, DS9, LaTeX, Linux/OSX Terminal, MOOG, PyRAF, XSPEC

Language English-First Language, Spanish-Conversational

Other Telescope Operation and Maintenance, Social Media Management, Science Commmunication