CLARA E. BRASSEUR

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EDUCATION

University of St Andrews; St Andrews, UK   *expected 2025*
PhD, Astronomy
Supervisor: Prof. Moira Jardine

Liverpool John Moores University; Liverpool, UK   *2019*
MSc with distinction, Astrophysics

Mills College; Oakland, California   *2010*
MA, Music Composition

Oberlin College; Oberlin, Ohio   *2008*
BA, Astrophysics and Music Composition. Mathematics minor

SELECTED EXPERIENCE

Postgraduate Researcher   *September 2021 – present*
University of St Andrews, St. Andrews, UK

- Multiwavelength study of AB Doradus; combining radio interferometry with coronal magnetic field model based on surface magnetic field maps to explore the magnetic structure of the star, leading to Brasseur et al. 2024.

- Studying the observability of Electron Cyclotron Maser (ECM) emission as the result of ejected slingshot prominences across a sample of M dwarfs.

- Developing software magnetic corona model that allows the creation of synthetic images and dynamic spectra.

Software Engineer   *May 2016 – August 2021*
Space Telescope Science Institute (STScI), Baltimore, MD

- Software developer at the Mikulski Archive for Space Telescopes (MAST).

- Created scalable all-sky imagery from Panoramic Survey Telescope and Rapid Response System (PanSTARRS) data.

- Documented, improved, and extended the MAST Application Programming Interface (API).
    * Developed MAST module for Astroquery Python package
    * Led trainings on usage of RESTful and Python APIs
    * Developed new API functionality for image cutouts

- Developed Astrocut python package for astronomical image cutouts, providing streamlined data access to astronomers and relieving pressure on archive infrastructure.

- On development team for TESScut and zCut cutout services, which allow astronomers to download astronomical cutouts from the TESS mission and Hubble deep field surveys respectively, both based on Astrocut.

- Developed Astronify python package for sonifying time series data, helping to increase access to astronomical data for blind and visually impaired astronomers.

- Developed interactive plots for the MAST web interfaces exo.MAST and z.MAST.

- Provided user support including responding to helpdesk questions.

- Performed sustaining engineering for general software maintenance and reduction of technical debt.

- Supported and mentored undergraduate interns.

Research Assistant for Dr. Rachel Osten *Septemper 2015 – August 2021*

Space Telescope Science Institute (STScI), Baltimore, MD

- Multiwavelength (visible/ultra-violet) exploration of stellar flares using the overlapping surveys from the Galaxy Evolution Explorer (GALEX), and Kepler space telescopes.

- Detected and analyzed a collection of short-duration ultra-violet flares in GALEX data, leading to Brasseur et al, 2019.

- Explored Kepler flares in corresponding Kepler data to better understand flare energy fractionation and frequency distributions, leading to Brasseur et al, 2022.

Cryptanalyst *July 2011 – April 2016*

National Security Agency (NSA), Fort Meade, MD

- Devised statistical and analytic tests for data diagnosis; developed software to apply tests and processing based on results.

- Modified high interest information gathering algorithm, by using theoretical mathematics to explore trade-offs in effort, efficiency, and accuracy.

- Designed algorithm in C/C++ for implementation of secure information sharing protocol and worked jointly to implement it in a cross-platform application. Achieved five-fold improvement in application speed through parallelization of code. Demonstrated program prototype to management and potential customers.

- Brought legacy production Perl scripts up to agency coding standards, adding robust error handling, increased flexibility in supported file types, and detailed succinct logs

HONORS AND AWARDS

Lancelot M. Berkeley Prize (as part of Astropy Collaboration) *2025*

Awarded to the Astropy Collaboration "for their work developing and maintaining this code base, which provides underlying support for much of astronomy research as it is conducted today."

Co-I on NASA Foundation Award *2024*

"Investing in the Astropy Project to Enable Research and Education in Astronomy"
$1.8M, PI Dr. Erik Tollerud

Cool Stars 22 Conference Grant *2024*

Awarded in support of conference participation.

St Leonards College Travel Fund Award *2023*

£160 awarded in support of conference travel.

Co-I on Hubble Treasury Program *2023*

"From High-Energy Particle Beam Heating in Stars to Ozone Destruction in Planets: NUV Spectra as the Fulcrum for a Comprehensive Understanding of Flaring M Dwarf Systems"
8 visits of 7 orbits each, PI Dr. Adam Kowalski

Arthur Maitland Prize *2023*

Awarded to the best student talk in Physics and Astronomy.

Astropy Moore Foundation/NASA ROSES Grants *2021,2022,2024*

$25,700, "Astroquery Maintenance"
$6,600, "Develop Astropy Learn Materials"
$6,000, "Astropy Leadership and Coordination Committee"

AURA Technology and Innovation Outstanding Achievement Award *2020*

Award presented annually to a single individual or team among all AURA centers for significant innovative contribution and demonstrated excellence in an area of technology. Sole recipient of the 2020 award in recognition of development work for Astrocut and associated cutout services.

Co-I in STScI Director's Discretionary Research Fund Grant *2019*

"Sonifying MAST: Engagement and Accessibility for The BVI Community"
$60,000, PI Dr. Scott Fleming

Research Support from NASA Astrophysics Data Analysis Program Grant *2019*

"Mining Multiwavelength Flares with Kepler and GALEX"
$141,400, PI Dr. Rachel Osten

STScI Team Award *2019*

Awarded in recognition of the TESS data archive release success.

Co-I in STScI Director's Discretionary Research Fund Grant *2018*

"Mining Multi-wavelength Flares with Kepler and GALEX"
$32,000, PI Dr. Rachel Osten

Music Alumni Scholarship *2008-2009*

Awarded in support of graduate studies in music composition at Mills College.

Vance Mathematics scholarship *2004-2008*

Application-based scholarship awarded in support of mathematics study at Oberlin College.

John F Oberlin scholarship *2004-2008*

Merit-based scholarship awarded in support of undergraduate studies at Oberlin College.

SELECTED PUBLICATIONS

Brasseur, C. E., M. M. Jardine, G.A. J. Hussain. "Constraining the coronal properties of AB Dor in the radio regime" Monthly Notices of the Royal Astronomical Society, 530.2, (2024): 2442.

Brasseur, C. E., Rachel A. Osten, Isaiah I. Tristan, and Adam F. Kowalski. "Constraints on Stellar Flare Energy Ratios in the NUV and Optical from a Multiwavelength Study of GALEX and Kepler Flare Stars" The Astrophysical Journal 994.1 (2023): 5.

Astropy Collaboration, Adrian M. Price-Whelan, Pey Lian Lim, Nicholas Earl, Nathaniel Starkman, Larry Bradley, David L. Shupe, Aarya A.Patil, Lia Corrales, **C. E. Brasseur**, et al. "The Astropy Project: Sustaining and Growing a Community-oriented Open-source Project and the Latest Major Release (v5.0) of the Core Package" The Astrophysical Journal 935.2 (2022): 167.

Fleming, Scott W., Chase Million, Rachel A. Osten, Dmitrii Y. Kolotkov, and **C. E. Brasseur**. "New Time-Resolved, Multi-Band Flares In The GJ 65 System With gPhoton" The Astrophysical Journal (2022): 8.

Brasseur, C. E., Rachel A. Osten, and Scott W. Fleming. "Short-duration Stellar Flares in GALEX Data." The Astrophysical Journal 883.1 (2019): 88.

Ginsburg, Adam, B. M. Sipőcz, **C. E. Brasseur**, et al. "astroquery: An Astronomical Web-querying Package in Python." The Astronomical Journal 157.3 (2019): 98.

TALKS (* INDICATES INVITED, ‗ INDICATES INTERNATIONAL)

* AAS Plenary for Lancelot M Berkeley Prize on behalf of Astropy Collaboration
January 2025, National Harbour, USA *(planned)*

The extended corona of a young Sun: combined VLBI/spectropolarimetry observations
June 2024 Cool Stars 22, San Diego, USA, available online
July 2024 National Astronomy Meeting, Hull, UK

* Stellar Flare Energy Ratios: NUV vs Optical
Centro de Rádio Astronomia e Astrofísica Mackenzie Colloquium

The Radio Corona of AB Dor
December 2023 SUPA Cormack Meeting, Glasgow, UK
December 2023 Solar/stellar St. Andrews/MPS workshop, St Andrews, UK
May 2023 PhD Annual Assessment Conference, St Andrews, UK
April 2023 Bcool Meeting, Göttingen, Germany

* Hearing the Light: Astronomical Data Sonification
January 2023 Edinburgh Astronomy Society, available online
March 2023 Clydesdale Astronomy Society
February 2024, St Leanoard's College Lecture Series
May 2024, British Astronomical Society One Day Spring Meeting 2024

* Software Development in Astronomy
February 2023 St Andrews Interdisciplinary Science Conference, St Andrews, UK

Stellar magnetic field manifestations: prominences and flares
July 2022 Cool Stars 21, Toulouse, France

* Making Astronomy More Accessible for Blind and Visually Impaired Audiences
February 2022 NASA Universe of Learning Science Briefing

Sonifying Your Presentation for Accessibility
November 2021 SciAccess Conference

Hearing The Light: How Sonification Deepens our Understanding of the Cosmos and Makes Astronomy More Accessible
November 2020 Space Telescope Science Institute Public Lecture Series, available online

Astronify: listening to the stars
November 2020 Astronomical Data Analysis Software and Systems conference, available online

* Stellar Flares in GALEX and Kepler
July 2020 Centre for Fusion, Space and Astrophysics Seminar, Warwick University, Warwick, UK

* Work smart not hard: *How Astrocut/TESScut efficiently cuts TESS full-frame image sets*
April 2020 Open Planetary Lunch Talks, available online

* Short Duration Flares in GALAX Data
December 2019 Solar Focus Meeting, University of Colorado, Boulder, CO

* Accessing TESS Data Programmatically: A MAST case study
July 2019 TESS/Kepler Asteroseismology Consortium workshop, MIT, Cambridge, MA

* TESScut and ExoMAST: Working with TESS Time Series Data
February 2019 TESS Data Workshop, Space Telescope Science Institute, Baltimore, MD

Astrocut: A cutout service for TESS full-frame image sets
November 2018 Astronomical Data Analysis Software and Systems conference, College Park, MD

Short Duration Flares in GALAX Data
July 2018 COSPAR conference, Pasadena, CA

The MAST API: Accessing Space Telescope Data Programmatically
October 2017 Astronomical Data Analysis Software and Systems conference, Santiago, Chile

POSTER PRESENTATIONS

The Radio Corona of AB Dor
Brasseur, Clara E. and Jardine Moira M. SUPA Annual Gathering 2024, Glasgow, UK and May 2024 PhD Annual Assessment Conference, St Andrews, UK

zCut: extending Astrocut for deep fields
Brasseur, C. & MAST Team. AAS 235, Honolulu, HI [109.21](2020)

MAST APIs: Present to Future
Brasseur, C and Donadson, T. Astronomical Data Analysis Software and Systems conference, Groningen, Netherlands (2019)

AstroCut: A cutout service for TESS full-frame image sets
Brasseur, Clara; White, Rick; Fleming, Scott W.; Mullally, Susan E.; Phillip, Carlita; Hargis, Jonathan; Fox, Mike; Smith, Arfon M. AAS 233 [245.10] (2019)

Short Duration Flares in GALAX Data
Brasseur, Clara; Osten, Rachel A. AAS 232 [317.01] (2018)

COMMUNITY ENGAGEMENT

Astropy Learn Coordinator, August 2024-present. Oversee the Astropy "Learn" ecosystem.

Astropy Coordination Committee member, 2023-present. Overall coordination and management of the Astropy project.

Maintainer, Astroquery, 2019-present. Develop and manage community contributions to Astroquery package for querying astronomical web forms and databases.

Journal Article Referee, Monthly Notices of the Royal Astronomical Society; Journal of Open Source Software.

Science Organizing Committee, Astro Hack Week, 2022. Week-long workshop that combines summer school and unconference.

Science Organizing Committee, Python in Astronomy, 2020. Week-long workshop on Python in Astronomy, reduced to 24 hour virtual hackatho due to COVID-19.

Member, Royal Astronomical Society, 2023-present.

Member, American Astronomical Society, 2016-2021.

TECHNICAL SKILLS

Programming Languages and Frameworks
Python, C, C++, C#, Fortran, JavaScript, ExtJS, Perl, Tornado, HTML/CSS, MS SQL, Git, GitHub, Jupyter, LaTex, Overleaf, DS9, Aladdin, Mathematica, VMware/vSphere, Linux, Bash, Condor, WinDbg, GNU Debugger, Valgrind, Visual Studio, Certified Scrum Master

Observing experience
Apache Point Observatory 3.5-meter telescope, 3 nights, ARC Telescope Imaging Camera, Dual Imaging Spectrograph.

TEACHING EXPERIENCE

Computational Astrophysics Demonstrator   *January-April 2022,2023*
University of St Andrews, St Andrews, UK
Provided guidance for students in this third year course on both astronomy topics and Fortran programming.

Using Python to Search NASA's Astrophysics Archives   *January, June 2018-2021*
American Astronomical Society Meetings
Collaborated with a team of astronomers and software engineers from multiple NASA archives to present a hands-on tutorial/workshop that introduces participants to command-line data access tools specifically using virtual observatory protocols in Python.

TESS Data Workshop   *February 2019*
Space Telescope Science Institute, MD
Prepared and taught an hour and a half introduction to the use of the TESScut software.

Introduction to MAST APIs   *June 2017*
Space Telescope Science Institute, MD
Prepared and taught workshops on the usage of the MAST RESTful and Astroquery APIs.

Graduate Teaching Assistant   *August 2009 – May 2010*
Mills College, Oakland, CA
Prepared and taught two semesters of undergraduate Basic Musicianship II. Initiated restructuring of the Mills musicianship curriculum.