

Sheila A. Saguear

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EDUCATION

Ph.D. in Astronomy

University of Florida, Gainesville, FL

In Progress (Expected May 2026)

M.S. in Astronomy

University of Florida, Gainesville, FL

May 2022

B.A. in Astronomy and Physics, Cum Laude

Boston University, Boston, MA

May 2020

RESEARCH EXPERIENCE

Graduate Research Assistant, University of Florida Dept. of Astronomy (Gainesville, FL)

Sept 2020 – Present

- Used inferential statistics (Bayesian hierarchical modeling techniques) to constrain the orbital eccentricities of exoplanets around small stars using large telescope datasets, including time-series data from NASA's Kepler space telescope. Developed a user-friendly, open-source Python package called **photoeccentric** to measure orbital eccentricities with these methods.
- Designing an experiment to identify empirical relationships between planet properties and galactic location using machine learning (non-parametric, nonlinear regression).

Predoctoral Research Fellow, Center for Computational Astrophysics (Flatiron Institute) (New York, NY)

Jan – Jun 2023

Constrained stellar ages and metallicities for low-mass stars using stellar kinematics data from the *Gaia* space telescope.

Developed an open-source, user-friendly Python package called **zoomies** for constraining kinematic stellar ages. Work involved handling large datasets through relational databases.

Research Assistant, Boston University Dept. of Physics (Boston, MA)

Jan – Aug 2020

Measured the effectiveness of in-person, virtual, and hybrid teaching models by comparing student learning outcomes in introductory college physics labs using qualitative and quantitative research techniques in R.

Undergraduate Research Assistant, Boston University Dept. of Astronomy (Boston, MA)

Jan 2017 – May 2020

Processed time-series data from NASA's K2 space telescope and conducted a signal search for exoplanets orbiting small stars. Statistically constrained exoplanet occurrence rates based on a null detection result. Conducted a sample literature search for the PINES survey, a photometric search for transiting exoplanets around the smallest stars.

Directed Studies Student, CERN (CMS Experiment) (Geneva, CH)

Jan – Jul 2019

Improved the CMS Trigger System by training particle identification models with machine learning (Keras). Created firmware implementations and tested the performance of these machine learning algorithms for FPGAs with the Vivado high-level synthesis language, using the Python package `hls4ml`.

Intern, NASA Ames Research Center (Kepler/K2 Guest Observer Office) (Moffett Field, CA)

Jun – Aug 2018

Developed an exoplanet and supernova signal injection and recovery tool for Kepler GO's open-source Python package **lightcurve**, a Python tool for processing and analyzing time-series data from NASA's Kepler, K2, and TESS space telescopes.

PUBLICATIONS

As First Author

Sagear, Sheila; Ballard, Sarah; Gilbert, Gregory; Albornoz, Mariangel; Lam, Christopher

"[The Orbital Eccentricity-Radius Relation for Planets Orbiting M Dwarfs](#)"

Submitted to AAS Journals May 2025

Sagear, Sheila; Adrian M. Price-Whelan, Sarah Ballard, Yuxi (Lucy) Lu, Ruth Angus, David W. Hogg

"[zoomies: A tool to infer stellar age from vertical action in Gaia data](#)" (2024)

The Astrophysical Journal, Volume 977, Issue 1, id.49, 21 pp.

Sagear, Sheila; Ballard, Sarah

"[The Orbital Eccentricity Distribution of Planets Orbiting M dwarfs](#)" (2023)

Proceedings of the National Academy of Sciences, 120, 23

Sagear, Sheila; Allen, Emily; Duffy, Andrew; Jariwala, Manher

"[Student learning outcomes with hybrid computer simulations and hands-on labs](#)" (2020)

2020 Physics Education Research Conference Proceedings, 448-453

Sagear, Sheila; Skinner, Julie N.; Muirhead, Philip S.

"[Upper Limits on Planet Occurrence around Ultracool Dwarfs with K2](#)" (2020)

The Astronomical Journal, Volume 160, Issue 1, id.19, 7 pp.

As Nth Author

Tamburo, Patrick et al. (inc. **Sagear, Sheila**)

"[The Perkins INfrared Exosatellite Survey \(PINES\) I. Survey Overview, Reduction Pipeline, and Early Results](#)" (2022)

The Astronomical Journal, Volume 163, Issue 6, id.253, 18 pp.

Di Guglielmo, Giuseppe et al. (inc. **Sagear, Sheila**)

"[Compressing Deep Neural Networks on FPGAs to Binary and Ternary Precision with HLS4ML](#)" (2021)

Machine Learning: Science and Technology, 2, 015001

SOFTWARE

Author of the Python package **zoomies** (github.com/ssagear/zoomies)

Author of the Python package **photoeccentric** (github.com/ssagear/photoeccentric)

Contributor to the Python package **lightkurve** (github.com/lightkurve/lightkurve)

SELECTED CONFERENCE AND DEPARTMENT TALKS

March 2025: UConn Astronomy Seminar

March 2024: Extreme Solar Systems IV Conference (Poster)

July 2023: UCSC Other Worlds Laboratory Seminar

July 2023: Towards Other Earths Conference

June 2023: Emerging Researchers in Exoplanet Science VIII

June 2023: CCA Predoctoral Fellow Symposium

May 2023: CCA Lunch Talk

May 2022: Exoplanets IV Conference (Poster)

PROFESSIONAL SERVICE

Referee for AAS Journals

Member of NASA Science Interest Group (SIG) #2: Exoplanet Demographics

NASA Grant Review Panel Executive Secretary

TEACHING EXPERIENCE

Fall 2023: TA for AST 3018 - Astronomy & Astrophysics 1

Summer 2025: TA for Code/Astro Software Development Workshop

CURRENT & FORMER STUDENTS

Kohhei Bessho

Waseda University Undergrad (Exchange student at UF)

Mariangel Albornoz

UF Undergrad

Junaho Zhang

UF Undergrad / Current Aerospace Medical Technician at US Air Force