Lukas Stone

Education

August 2021 – Current
The Pennsylvania State University *State College, PA*
- Degree in progress: Ph.D., Astronomy and Astrophysics
- Current GPA: 3.97/4.0
- Expected Graduation: May 2027

August 2016 – May 2020
University of Oklahoma *Norman, OK*, Summa Cum Laude with Special Distinction
- Major: BS Astrophysics
- Cumulative GPA: 4.0/4.0

Awards and Honors

2021 - 2022 – **Homer F. Braddock Scholarship in Biology, Chemistry, and Physics**

2020 – **4.0 Medallion for Academic Excellence in Achieving an Overall 4.0 Grade Point Average at the University of Oklahoma**

2019 – **Duane E. Roller Award for Outstanding Scholarship in Physics and Astronomy**

2017, 2018, 2019, 2020 – **Homer L. Dodge Department of Physics and Astronomy Meritorious Scholarship**

Talks

Formal presentations
- Summer 2023 - Oral Comprehensive exam, "Gain Variability in a Speedster-EXD550 Hybrid CMOS X-ray Detector".

Informal presentations
- Fall 2023 - PSU Lunch Talk, "X-ray Hybrid CMOS Detectors: Status of the Event-Driven Speedster-EXD550 & Introducing the Next-gen Small-Pixel Detector".
- Spring 2023 - PSU Lunch Talk, "Gain Variability in a Speedster-EXD550 Hybrid CMOS X-ray Detector".
- Spring 2022 - PSU Lunch Talk, "Astrophysical Detectors and their application to X-ray astronomy".

Research/Work Experience

January 2022 – Current **Graduate Research** *Pennsylvania State University*, Advisor Dr. Abe Falcone
- Current research is focused on the development, characterization, and optimization of active-pixel Hybrid CMOS X-ray detectors.
- Characterizing the event-driven Speedster-EXD550 HCMOS detectors. More specifically, characterizing gain variation to optimize these detectors, as incorrect gain values will degrade the resulting X-ray energy spectrum and result in a poor energy resolution.
- Calibration of the event-driven Speedster-EXD550 HCMOS detectors for the NASA-funded BlackCAT CubeSat Mission.

June 2019 – May 2021 **Research Assistant** *University of Oklahoma*, Advisor Dr. Nathan Kaib
- Using data from 11 Nice model simulations, the hypothesis that close encounters with the giant planets as an explanation for the lack of binaries in the Hot Classical Belt (HCB) was investigated.
- I simulated the complete chronological close encounter history with the giant planets for 22 binaries over a range of masses and initial separations.
- Discovered a small subset of tight binaries that can be evolved and give rise to the small population of very wide binaries seen in today's HCB.

Presentations

1. 08/21/2023 - SPIE: Optics + Photonics 2023, "*Status of Testing and Characterization of the Speedster-EXD550 X-ray Hybrid CMOS Detector*", Oral presentation.

Publications

1. **Stone, L.R.,** et al., "*Status of testing and characterization of the Speedster-EXD550 x-ray hybrid CMOS detector.*" UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII. Vol. 12678. SPIE, 2023.
2. Colosimo, J., ...**Stone, L.R.,** et al., "*Current status of the BlackCAT CubeSat.*" UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII. Vol. 12678. SPIE, 2023.
3. Colosimo, J., Grzybowski, H., Jennerjahn, E., **Stone, L.R.,** Falcone, A.D., Wages, M., et al., *Initial Characterization of the first Speedster-EXD550 Event-Driven X-ray Hybrid CMOS Detectors*, Journal of Astronomical Telescopes, Instruments, & Systems (JATIS), 9(4), pp.046002-046002.
4. Campbell, H., **Stone, L.R.,** Kaib, N.A., "*Close Trans-Neptunian Object Passages as a Driver of the Origin and Evolution of Ultrawide Kuiper Belt Binaries.*" The Astronomical Journal 165.1 (2022): 19.
5. Colosimo, J., ...**Stone, L.R.,** et al., "*Estimating the background of the BlackCAT CubeSat and its impact on science observations.*" Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray. Vol. 12181. SPIE, 2022.
6. Baker, L., ...**Stone, L.R.,** et al., "*Mechanical and thermal design of the BlackCAT CubeSat.*" Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray. Vol. 12181. SPIE, 2022.
7. **Stone, L.R.,** Kaib, N.A., 2021. "*Evolution of primordial Kuiper belt binaries through a giant planet instability.*" Monthly Notices of the Royal Astronomical Society: Letters, 505(1), pp.L31-L35.