

Lukas Zalesky

Institute for Astronomy
University of Hawaii at Mānoa

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<https://cosmoslukas.github.io/>

Research Interests: extragalactic astronomy, including galaxy evolution, galaxy formation and evolution in the early universe, gravitational lensing, and quasars.

Education

PhD Astronomy

Institute for Astronomy, University of Hawaii at Mānoa

Honolulu, HI

Expected 2023

– Thesis: The Hawaii Twenty Square Degree Survey & the Galaxy Stellar Mass Function

M.S. Astronomy

Institute for Astronomy, University of Hawaii at Mānoa

Honolulu, HI

May 2020

– GPA: 3.94

B.S. Astrophysics

College of Charleston, Honors College

Charleston, SC

May 2018

– Thesis: Using Microlensing to Understand the Structure of Quasars

– GPA: 3.98, *Summa Cum Laude*

Refereed Publications

- 1. First Results from the Hawaii Twenty Square Degree Survey**
Zalesky, L., Sanders, D., et al. *ApJ in prep.*
- 2. The Hawaii Twenty Square Degree Survey: Overview**
McPartland, C., Zalesky, L., Sanders, D., et al. *ApJ in prep.*
- 3. The Farmer: A reproducible, profile-fitting photometry pipeline**
Weaver, J., Zalesky, L., et al. *ApJ in prep.*
- 4. Spin Measurements of Five Lensed Quasars**
Chartas, G., ... Zalesky, L., et al. *ApJ in prep.*
- 5. Hubble Space Telescope Imaging of X-ray Selected Galaxy Clusters**
Ebeling, H., Zalesky, L., Koekemoer, A., et al. *MNRAS in prep.*
- 6. AStroLens: Automatic Strong Lens-Modeling of X-ray Selected Galaxy Clusters**
Zalesky, L. and Ebeling, H. *MNRAS in press*, [ArXiv submission](#)
- 7. Measuring the Innermost Stable Circular Orbit of Supermassive Black Holes**
Chartas, G., Krawczynski, H., Zalesky, L., et al. 2017, *The Astrophysical Journal*, 837, 26

Research Experience

University of Hawai'i at Mānoa — Research Assistant

Advisor: *Dr. David Sanders*

August 2019-Present

- Spectral and photometric analysis of galaxies at $z > 3$ from the Hawai'i Two-0 Survey, constraining the high-redshift galaxy luminosity and stellar-mass functions.

University of Hawai'i at Mānoa — Research Assistant

Advisor: *Dr. Harald Ebeling*

September 2018-August 2019

- Created a novel algorithm to model the strong-lensing regions of galaxy clusters in an automated fashion.
- Modeled the mass distributions of > 100 massive galaxy clusters.

College of Charleston — Research Assistant

Advisor: *Dr. George Chartas*

May 2015-May 2018

- Developed a new and robust method for constraining the inclination angle, innermost stable circular orbit, and spin of a supermassive black hole.
- Analyzed the x-ray brightness variability of lensed quasar HS0810+2554 in order to determine the time delays and to constrain cosmological parameters.
- Developed a program to determine the bias of detecting emission lines in X-ray spectra obtained with the Chandra X-ray Observatory.

Teaching Experience

University of Hawai'i at Mānoa — Teaching Assistant

Astronomy 301: *Observational Astronomy* (> 20 students)

Spring 2020

- Gave computer programming/astrophysics software instruction, presentation skills, and research guidance.

Astronomy 110: *Survey of Astronomy, Lecture* (> 140 students)

Fall 2018 - Spring 2019

- Provided lectures and assistance in preparation for quizzes, tests, and homework

Astronomy 110: *Survey of Astronomy, Lab* (> 75 students)

Fall 2018 - Spring 2019, Spring 2020

- Led activities with telescopes and educational software.

Accepted Proposals

- **Keep It Simple: Massive Two-Body Mergers at $z \sim 0.6$**
Hubble Space Telescope and Chandra X-ray Observatory
 - Co-Investigator (2020), awarded 1 Primary Spacecraft Orbit and 44ks of *Chandra* time.
- **Monsters in the Making: Extreme Cluster Mergers at $z > 0.5$**
Hubble Space Telescope and Chandra X-ray Observatory
 - Co-Investigator (2019), awarded 29 Primary Spacecraft Orbits and 80ks of *Chandra* time.
- **Measuring the Innermost Stable Circular Orbit and Spin of Supermassive Black Holes**
Chandra X-ray Observatory
 - Co-Investigator (2016), awarded 900 ks of *Chandra* time.

Conferences & Presentations

- **Cosmic Dawn Center Summit** University of Copenhagen
The Hawaii Two-0 Galaxy Stellar Mass Function July 2020
- **School of Science and Mathematics Poster Session (Poster)** College of Charleston
Using Microlensing to Understand the Structure of Quasars April 2018
- **XMM-Newton: The Next Decade (Poster)** ESAC Madrid
Measuring the Innermost Stable Circular Orbit of Supermassive Black Holes May 2016
- **Astronomy Colloquium** College of Charleston
Measuring the Innermost Stable Circular Orbit of Quasar HE0435-1223 December 2016

Honors/Awards

Graduate

- National Science Foundation Graduate Research Fellowship Honorable Mention NSF, 2020
- Friends of the IfA Best Second Year Project Award Institute for Astronomy, 2020
- Friends of the IfA Best First Year Project Award Institute for Astronomy, 2019

Undergraduate

- Outstanding Graduate, awarded to top graduating senior Physics and Astronomy, 2018
- Departmental Honors in Astrophysics Research Physics and Astronomy, 2018
- Highly Distinguished Honors from Faculty Campus-wide, 2014-2018
- Dean's List Campus-wide, 2014-2018

Outreach

- **Maunakea Scholars**
Astronomer-mentor 2020-Present
 - Volunteer astronomy mentor, working with Hawaii high-school students to prepare telescope proposals and science projects..
- **Astrobites**
Contributing author — [read my astrobites](#) 2020-Present
 - Provide monthly blog posts summarizing recent discoveries in astronomy.
- **Institute for Astronomy Outreach**
Event assistant 2018-Present
 - Travel across the island to present science activities, organize star-gazing, hold Q&A, etc.
- **Adopt-a-Physicist**
Sigma Pi Sigma online mentor — [website](#) 2018-Present
 - Held and led an online forum for high school students to learn about the life of an active physicist.

- **Society of Physics Students Outreach w/ the College of Charleston**

Event assistant

2014-2018

- Assisted in hands on activities and star-gazing with telescopes throughout the city.
- Assisted in public viewing the August 2017 total solar eclipse.

Computational Skills

- **Operating Systems**

- Windows, MacOS/OS X, Linux/Unix

- **Computer Languages**

- IDL, Python, L^AT_EX, MATLAB, Mathematica, HTML, javascript, CSS

- **Astronomical Software**

- CIAO, ds9, XSpec, IRAF/PyRAF, SExtractor, SQL