

# 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

- Friends of the IfA Best First Year Project Award . . . . . Institute for Astronomy, 2019
- Friends of the IfA Best Second Year Project Award . . . . . Institute for Astronomy, 2020

### 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

- **Astrobites**  
*Contributing author — [read my astrobites](#)* 2020-Present
  - Provide monthly blog posts summarizing recent discoveries in astronomy.
- **Institute for Astronomy Outreach**  
*Various events throughout O'ahu* 2018-Present
  - Travel across the island to present science activities, organize star-gazing, hold Q&A, etc.
- **Adopt-a-Physicist**  
*Sigma Pi Sigma online service — [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**  
*Various events throughout the city* 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,  $\text{\LaTeX}$ , MATLAB, Mathematica, HTML, javascript, CSS
- **Astronomical Software**
  - CIAO, ds9, XSpec, IRAF/PyRAF, SExtractor, SQL