

# Stanley A. Baronett

barons2@unlv.nevada.edu  
unlv-spfg.github.io/team/baronett-stanley  
pfitsplus.github.io/team/baronett-stanley  
simonsfoundation.org/people/stanley-a-baronett

## Curriculum Vitae

## EDUCATION

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### University of Nevada, Las Vegas (**UNLV**)

Ph.D. in Astronomy

Las Vegas, NV

Fall 2022–present

- Advisor: **Zhaohuan Zhu**
- Dissertation: “From Dust to Planets: Dust–Gas Dynamics and Radiation Transport in Protoplanetary Disks”

### UNLV

M.S. in Astronomy, GPA: 4.00/4.00

Las Vegas, NV

Fall 2020–Spring 2022

- Advisors: **Zhaohuan Zhu**, **Chao-Chin Yang**
- Thesis: “Dust–Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients”

### UNLV

B.S. in Physics, GPA: 3.76/4.00

Las Vegas, NV

Fall 2018–Spring 2020

- Concentration in Computational Physics
- **Sigma Pi Sigma** (honor society for physics and astronomy)

### University of Hawai‘i at Mānoa (**UHM**)

M.A. in Philosophy, GPA: 3.96/4.00

Honolulu, HI

Fall 2013–Fall 2015

- Advisors: **Roger Ames**, **Kenneth Kipnis**
- Thesis: “**Sustaining Harmony Through Professional Roles**”

### UHM

B.A. in Philosophy, GPA: 3.88/4.00

Honolulu, HI

Fall 2007–Spring 2012

- Magna Cum Laude
- **Phi Beta Kappa** (academic honor society)

## EXPERIENCE

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### UNLV

UNLV Foundation Board of Trustees Graduate Fellow

Las Vegas, NV

Summer 2021–Spring 2024

- Dust–gas dynamics and radiation transport in protoplanetary disks
- Developing self-consistent global **Athena++** models with multigroup radiation-hydrodynamics and dust

### UNLV

Graduate Research Assistant under **Zhaohuan Zhu**

Las Vegas, NV

Summer 2021–Spring 2024

- **Dust–gas dynamics driven by the streaming instability with various pressure gradients**
- Developed and analyzed **Athena++** models with Lagrangian particles

### Center for Computational Astrophysics (**CCA**), Flatiron Institute (**FI**)

Pre-Doctoral Research Analyst under **Yan-Fei Jiang** and **Phil Armitage**

New York, NY

Sept. 2023–Jan. 2024

- Frequency-dependent dust opacities for irradiated disks
- Developed and compared models between **Athena++** with multigroup radiation and **RADMC-3D**

## FI Computational Fluid Dynamics for Astrophysics Summer School

New York, NY

One of 20 invited students out of 200 applicants

July 2023–Aug. 2023

- Finite-volume, spectral, smooth-particle-hydrodynamics, moving-mesh, and high-order numerical techniques
- Applied tutorials on physical processes (MHD and radiation transport) and architectures (CPU and GPU)

## UNLV

Las Vegas, NV

Jason Steffen Research Group

Summer 2019–present

- Stellar evolution and tidal dissipation on planetary orbital dynamics
- Contributed REBOUNDx modules for dissipative tides and parameter interpolation of MESA stellar data

## UNLV

Las Vegas, NV

Student Assistant under Qiang Zhu

Spring 2020

- Web application development
- Topological Phonon Database and Virtual X-ray Diffraction

## Qdigital Technology Services

Las Vegas, NV

IT Consultant

Aug. 2016–Aug. 2018

- Managed services, networking, systems infrastructure, support, information security, cloud and on-premises project implementation and deployment, enterprise resource planning, and web development

## Hawaii Natural Energy Institute

Honolulu, HI

IT Specialist

Feb. 2009–May 2016

- Procured, deployed, and managed hardware, software, networks, and web content

## PUBLICATIONS

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8. Lim, J., Simon, J. B., Li, R., Carrera, D., **Baronett, S. A.**, Youdin, A. N., Lyra, W. & Yang, C.-C. Probing Conditions for Strong Clumping by the Streaming Instability: Small Dust Grains and Low Dust-to-gas Density Ratio. *ApJ* **981**, 160. doi:[10.3847/1538-4357/adb311](https://doi.org/10.3847/1538-4357/adb311) (Mar. 2025).
7. Lepp, S., Martin, R. G. & **Baronett, S. A.** Polar Orbits around the Newly Formed Earth–Moon Binary System. *ApJ* **971**, 73. doi:[10.3847/1538-4357/ad62fa](https://doi.org/10.3847/1538-4357/ad62fa) (Aug. 2024).
6. Chen, C., **Baronett, S. A.**, Nixon, C. J. & Martin, R. G. On the origin of polar planets around single stars. *MNRAS* **533**, L37–L42. doi:[10.1093/mnrasl/slae058](https://doi.org/10.1093/mnrasl/slae058) (Sept. 2024).
5. **Baronett, S. A.**, Yang, C.-C. & Zhu, Z. Dust-gas dynamics driven by the streaming instability with various pressure gradients. *MNRAS* **529**, 275–295. doi:[10.1093/mnras/stae272](https://doi.org/10.1093/mnras/stae272) (Mar. 2024).
4. Ferich, N., **Baronett, S. A.**, Tamayo, D. & Steffen, J. H. The Yarkovsky Effect in REBOUNDx. *ApJS* **262**, 41. doi:[10.3847/1538-4365/ac8d60](https://doi.org/10.3847/1538-4365/ac8d60) (Oct. 2022).
3. **Baronett, S. A.**, Ferich, N., Tamayo, D. & Steffen, J. H. Stellar evolution and tidal dissipation in REBOUNDx. *MNRAS* **510**, 6001–6009. doi:[10.1093/mnras/stac043](https://doi.org/10.1093/mnras/stac043) (Mar. 2022).
2. Li, J., Liu, J., **Baronett, S. A.**, Liu, M., Wang, L., Li, R., Chen, Y., Li, D., Zhu, Q. & Chen, X.-Q. Computation and data driven discovery of topological phononic materials. *Nature Communications* **12**, 1204. doi:[10.1038/s41467-021-21293-2](https://doi.org/10.1038/s41467-021-21293-2) (Jan. 2021).
1. **Baronett, S. A.** in *Distributing Worlds through Aesthetic Encounters* (eds Stoll, J., Xiang, S. & Underwood, B.) 141–153 (Cambridge Scholars Publishing, 2018).

(3 as first author, 2 as second author; h-index of 5)

**Refereed authorship on the Astrophysics Data System (ADS)**

## AWARDS

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|   |                             |           |
|---|-----------------------------|-----------|
| • UNLV Foundation Board of Trustees Fellowship                  | (\$30,000/yr.)              | 2024–2026 |
| • Summer Doctoral Research Fellowship (UNLV)                    | (\$7,000)                   | 2024      |
| • <b>FI CCA Pre-doctoral Fellowship</b>                         |                             | 2023–2024 |
| • Russell L. and Brenda Frank Scholarship                       | (\$2,500, \$2,830, \$2,900) | 2022–2025 |
| • <b>Nevada NASA Space Grant Consortium Graduate Fellowship</b> | (\$20,000)                  | 2021–2022 |
| • Alumni Association Scholarship (UNLV)                         | (\$2,500)                   | 2021–2022 |
| • Donna Weistrop and David B. Shaffer Scholarship               | (\$1,000)                   | 2021–2022 |
| • Patricia Sastaunik Scholarship                                | (\$2,500)                   | 2021–2022 |
| • Russell L. and Brenda Frank Scholarship                       | (\$2,500)                   | 2020–2021 |
| • Kenneth R. Sites Physics Scholarship                          | (\$1,500)                   | 2019–2020 |
| • Dean’s Honor List (UNLV)                                      |                             | 2018      |
| • Departmental Merit Scholarship (Philosophy, UHM)              |                             | 2013–2015 |
| • Departmental Merit Scholarship (Philosophy, UHM)              |                             | 2008–2011 |
| • Dean’s List (UHM)   |                             | 2007–2012 |

## PRESENTATIONS

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|  |      |
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| • <b>Poster</b> , <b>Europlanet Science Congress 2024</b> , Berlin, Germany  | 2024 |
| <i>Radiation hydrodynamics of protoplanetary disks with frequency-dependent dust opacities</i> (Sept. 8–13)  |      |
| • <b>Poster</b> , <b>Emerging Researchers in Exoplanet Science Symposium IX</b> , Cornell University, Ithaca, NY   | 2024 |
| <i>Radiation hydrodynamics of protoplanetary disks with frequency-dependent dust opacities</i> (Jul. 10–12)  |      |
| • <b>Poster</b> , <b>50 years of Binaries and Discs: Lubow@75</b> , UNLV, Las Vegas, NV  | 2024 |
| <i>Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients</i> (May 6–9)   |      |
| • <b>Talk</b> , Center for Computational Astrophysics Pre-Doc Symposium, FI, New York, NY  | 2024 |
| <i>Radiation Transport in Protoplanetary Disks</i> (Jan. 19)   |      |
| • <b>Poster</b> , <b>Origins of Solar Systems Gordon Research Conference: Chemical and Dynamical Constraints on Planet Formation</b> , Mount Holyoke College, MA                                       | 2023 |
| <i>Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients</i> (Jun. 11–16)  |      |
| • <b>Poster</b> , <b>Origins of Solar Systems Gordon Research Seminar: Constraining the Origin and Evolution of Planetary Systems Through a Multidisciplinary Approach</b> , Mount Holyoke College, MA | 2023 |
| <i>Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients</i> (Jun. 10–11)  |      |
| • <b>Poster</b> , <b>AASTCS 9: Exoplanets IV</b> , Las Vegas, NV   | 2022 |
| <i>Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients</i> (May 2–6)   |      |
| • <b>Exhibit</b> (Virtual), <b>NASA@SC21</b> , NASA Science and Engineering Powered by HPC   | 2021 |
| <i>Protoplanetary Disk Simulations from Large to Small Scales</i> (Nov. 8)   |      |
| • <b>Seminar</b> (Virtual), <b>Orbital Dynamics &amp; Planetology Group</b> , São Paulo State University, Brazil   | 2021 |
| <i>Stellar Evolution and Tidal Dissipation in REBOUNDx</i> (Apr. 16)   |      |

## TEACHING

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|   |                       |
|---|-----------------------|
| • <b>Instructor</b> at UNLV                                     | Fall 2020–Spring 2021 |
| <i>Physics for Scientists and Engineers Lab III (PHYS 182L)</i> |                       |
| • <b>Grader</b> at UHM  | Fall 2013             |
| <i>Introduction to Deductive Logic (PHIL 110)</i>               |                       |

## MENTORING

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- **Sudat Khan**, Ph.D. student (UNLV) Fall 2024–present  
*Reviewed funding applications, provided Ph.D. program guidance, helped optimize use of NASA Advanced Supercomputing Division resources*
- **Hening Wu**, Ph.D. student (UNLV) Fall 2024–present  
*Consulted on code development using the multigroup nonrelativistic radiation transport module for Athena++*

## SERVICE

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- **Reviewer** for the following journals 2024  
*Monthly Notices of the Royal Astronomical Society*
- **Organizer** for **UNLV Star & Planet Formation Group Meetings** Fall 2024–present  
*Scheduled, hosted, and facilitated talks, visitors, and weekly discussions*

## OUTREACH

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- **Lead Organizer**, **Astronomy on Tap, Las Vegas** 2022–present  
*Organized the following events:*  
“Astronomy on Tap, Las Vegas XIII” (Mar. 27, 2025)  
“Astronomy on Tap, Las Vegas XII” (Oct. 17, 2024)  
“Astronomy on Tap, Las Vegas XI” (Mar. 5, 2024)  
“VAR! 100 Years of Variable Stars & Extragalactic Astronomy” (Oct. 3, 2023)  
“Journey to the Center of the Earth” (June 20, 2023)  
“Universe in a Box” (Mar. 2, 2023)  
“Backyard Telescopes” (May 26, 2022)  
“The Horrors of Black Holes” (Oct. 27, 2022)
- **Judge**, **Beal Bank USA Southern Nevada Regional Science & Engineering Fair** 2022–2024  
*Elementary, middle, and high school divisions*
- **Event Supervisor**, **Nevada Science Olympiad State Tournament, Division B (middle school)** 2022–2023  
*Developed and administered written exams for the *Solar System* event*
- **Exhibit**, **Inquiry III: The Art of Scientific Discovery (UNLV College of Sciences)** Oct. 2022  
*Submitted a display piece entitled “Streaming Instability”*
- **Assistant Organizer**, **Neighborhood Star Party, Las Vegas, NV** 2022  
*Helped Prof. Jason Steffen organize the event at Sonoma at Summerlin by Coleman HOA (Oct. 8)*