

EDUCATION

University of Nevada, Las Vegas (UNLV)	Las Vegas, NV
Ph.D. in Astronomy (Advisor: Zhaohuan Zhu)	2022–2026
M.S. in Astronomy, GPA: 4.00/4.00 (Advisors: Zhaohuan Zhu, Chao-Chin Yang)	2020–2022
B.S. in Physics, Concentration in Computational Physics, GPA: 3.76/4.00	2018–2020
University of Hawai'i at Mānoa (UHM)	Honolulu, HI
M.A. in Philosophy, GPA: 3.96/4.00 (Advisors: Roger Ames, Kenneth Kipnis)	2013–2015
B.A. in Philosophy, GPA: 3.88/4.00 (Magna Cum Laude)	2007–2012
Advanced Technologies Academy	Las Vegas, NV
Honors Diploma in Computer Science, weighted GPA: 4.675/4.000	2003–2007

EMPLOYMENT

UNLV	Las Vegas, NV
UNLV Foundation Board of Trustees Graduate Fellow	Aug. 2024–May 2026
Summer Doctoral Research Fellow	May 2024–Aug. 2024
Graduate Research Assistant	May 2021–Aug. 2023, Jan. 2024–May 2024
Graduate Teaching Assistant	Aug. 2020–May 2021
Student Assistant	Jan. 2020–May 2020
Center for Computational Astrophysics, Flatiron Institute	New York, NY
Pre-Doctoral Research Analyst	Sept. 2023–Jan. 2024
Qdigital Technology Services	Las Vegas, NV
IT Consultant	Aug. 2016–Aug. 2018
Hawaii Natural Energy Institute	Honolulu, HI
IT Specialist	Feb. 2009–May 2016

AWARDS

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

SERVICE

Reviewer for the following journals

Monthly Notices of the Royal Astronomical Society (MNRAS) 2024

Organizer for UNLV Star & Planet Formation Group (SPFG) Meetings

Fall 2024–Spring 2025

Scheduled, hosted, and facilitated talks, visitors, and weekly discussions

Web Developer: created, deployed, and maintained websites for
Planet Formation in the Southwest Plus (PFITS+) collaboration
UNLV SPFG
Atomic-Level Structural Dynamics in Catalysts (ALSDC) Group
Materials Modeling and Informatics (MMI)

2024–present

2021–present

2020

2020

MEMBERSHIP

- **American Astronomical Society (AAS)** 2025–present
- **Phi Beta Kappa (ΦBK)**, the oldest academic honor society in the United States 2011–present
- **Sigma Pi Sigma (ΣΠΣ)**, American honor society for physics and astronomy 2020–present

TEACHING

- **Teaching Assistant** at UNLV Fall 2020–Spring 2021
Physics for Scientists and Engineers Lab III (PHYS 182L)
- **Grader** at UHM Fall 2013
Introduction to Deductive Logic (PHIL 110)

MENTORING

- **Sudat Khan**, Ph.D. student (UNLV) Fall 2024–present
Reviewed funding applications, provided guidance on Ph.D.-program and advisor–advisee relationship, helped optimize use of NASA Advanced Supercomputing (NAS) Division resources
- **Hening Wu**, Ph.D. student (UNLV) Fall 2024–present
Consulted on Athena++ code development and use of NAS resources

OUTREACH

Leadership

- **Astronomy on Tap, Las Vegas** 2022–present
Lead organizer of the following events:
“Astronomy on Tap, Las Vegas XIII”, “Astronomy on Tap, Las Vegas XII”, “Astronomy on Tap, Las Vegas XI”,
“VAR! 100 Years of Variable Stars & Extragalactic Astronomy”, “Journey to the Center of the Earth”, “Universe in a Box”, “Backyard Telescopes”, “The Horrors of Black Holes”
- Neighborhood Star Party, Las Vegas, NV Oct. 2022
Helped Prof. Jason Steffen organize the event at Sonoma at Summerlin by Coleman HOA

STEM Engagement

- **Event Supervisor**, Nevada Science Olympiad State Tournament, Division B (middle school) 2022–2023
Developed and administered written exams for the [Solar System event](#)
- **Judge**, Beal Bank USA Southern Nevada Regional Science & Engineering Fair 2022–2025
Elementary, middle, and high school divisions

Exhibitions

- **Inquiry IV: The Art of Scientific Discovery** (UNLV College of Sciences) Apr. 2025
Display piece entitled “[Streaming Instability II](#)”
- **Inquiry III: The Art of Scientific Discovery** (UNLV College of Sciences) Oct. 2022
Display piece entitled “[Streaming Instability](#)”
- **NASA@SC21**, NASA Science and Engineering Powered by HPC Nov. 2021
Protoplanetary Disk Simulations from Large to Small Scales

PUBLICATIONS

Refereed authorship on the SAO/NASA Astrophysics Data System (ADS)

11. **Baronett, S. A.**, Lyra, W., Aly, H., Brouillette, O., De Cun, V. I., Flock, M., Huang, P., Krapp, L., Lesur, G., Li, S., Lim, J., Paardekooper, S.-J., Simon, J. B., Sudarshan, P. & Yang, C.-C. Streaming Instability Code Comparison: Unstratified Models with Stokes Unity (in prep.).
10. **Baronett, S. A.**, Jiang, Y.-F., Zhu, Z., Zhang, S. & Armitage, P. J. A Framework to Model Stellar Irradiated Disks with Frequency-dependent Absorption and Scattering Opacities in Athena++. *ApJ* (submitted).
9. Lim, J., **Baronett, S. A.**, Simon, J. B., Yang, C.-C., Sengupta, D., Umurhan, O. M. & Lyra, W. Bridging Unstratified and Stratified Simulations of the Streaming Instability for $\tau_s = 0.1$ Grains. *ApJ*. arXiv: [2505.23902](#) (in press).
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](#) (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](#) (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/mnras/slac058](#) (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/stac272](#) (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](#) (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](#) (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](#) (Jan. 2021).
1. **Baronett, S. A.** in *Distributing Worlds through Aesthetic Encounters* (eds Stoll, J., Xiang, S. & Underwood, B.) 141–153 (Cambridge Scholars Publishing, Nov. 2017).
<https://www.cambridgescholars.com/product/978-1-5275-0035-8>.

PRESENTATIONS

Seminars

- (Invited) **Orbital Dynamics & Planetology Group**, São Paulo State University, Brazil 2021
Stellar Evolution and Tidal Dissipation in REBOUNDx (Apr. 16)

Talks

- **Center for Computational Astrophysics Pre-Doc Symposium**, Flatiron Institute, New York, NY 2024
Radiation Transport in Protoplanetary Disks (Jan. 19)

Posters

- **Origins of Solar Systems Gordon Research Conference (GRC)**, Mount Holyoke College, MA 2025
From Dust to Planets: Dust-Gas Dynamics and Radiation Transport in Protoplanetary Disks (Jun. 15–20)
- **Europlanet Science Congress**, Berlin, Germany 2024
Radiation hydrodynamics of protoplanetary disks with frequency-dependent dust opacities (Sept. 8–13)
- **Emerging Researchers in Exoplanet Science Symposium IX**, Cornell University, Ithaca, NY 2024
Radiation hydrodynamics of protoplanetary disks with frequency-dependent dust opacities (Jul. 10–12)
- **50 years of Binaries and Discs: Lubow@75**, University of Nevada, Las Vegas 2024
Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients (May 6–9)
- **Origins of Solar Systems GRC**, Mount Holyoke College, MA 2023
Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients (Jun. 11–16)
- **Origins of Solar Systems Gordon Research Seminar**, Mount Holyoke College, MA 2023
Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients (Jun. 10–11)
- **AASTCS 9: Exoplanets IV**, Las Vegas, NV 2022
Dust-Gas Dynamics Driven by the Streaming Instability with Various Pressure Gradients (May 2–6)

EXPERIENCE

UNLV

UNLV Foundation Board of Trustees Graduate Fellow

Las Vegas, NV

Fall 2024–Spring 2026

- Dust–gas dynamics and radiation transport in protoplanetary disks
- Developed computational frameworks linking stellar irradiation, disk thermodynamics, and aerodynamic processes driving planetesimal formation

Center for Computational Astrophysics, 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 hydrostatic models between **Athena++** with multigroup radiation and **RADMC-3D**

FI Computational Fluid Dynamics for Astrophysics Summer School

One of 20 invited students out of 200 applicants

New York, NY

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

Graduate Research Assistant under Zhaohuan Zhu

Las Vegas, NV

May 2021–May 2024

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

UNLV

Jason Steffen Research Group

Las Vegas, NV

May 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

Student Assistant under Qiang Zhu

Las Vegas, NV

Jan. 2020–May 2020

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

Qdigital Technology Services

IT Consultant

Las Vegas, NV

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

IT Specialist

Honolulu, HI

Feb. 2009–May 2016

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