ASHLEY A. ELLIOTT

CONTACT INFORMATION

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EDUCATION

Louisiana State University (LSU) August 2021 - Current
PhD Candidate: Physics
Projected Graduation: May 2026

- Dissertation Topic: "A Detailed Characterization of Exoplanets and Their Host Stars with the CHARA Array"
- Thesis Advisor: Dr. Tabetha Boyajian

Embry-Riddle Aeronautical University, Prescott (ERAU) August 2017 - May 2021
Bachelor of Science: Space Physics; Minor: Computer Science

CURRENT POSITION

Graduate Student August 2021 - Current
Department of Physics and Astronomy, Louisiana State University
Baton Rouge, Louisiana, USA

RESEARCH INTERESTS

- Characterizing exoplanetary systems using direct methods
- Astronomical optical interferometry, instrumentation

PUBLICATIONS ACCEPTED

Summary: 5 peer-reviewed publications, 2 first-author. Total citations: 150, *h-index:* 4 (per GoogleScholar, May 2025).

5. "Measuring the Stellar and Planetary Parameters of the 51 Eridani System"
   Elliott, Ashley., Boyajian, T., Ellis, T., von Braun, K., Mann, A., & Schaefer, G., *Publications of the Astronomical Society of Australia.* V.41,I.43, September 2024, doi:10.1017/pasa.2024.04
4. "First leptophobic dark matter search from the coherent-CAPTAIN-Mills liquid argon detector"
   Aguilar-Arevalo, A.A., Alves, D.S.M., Biedron, S., Boissevain, J., and 46 others including **Elliott, Ashley.** (CCM Collaboration), *Physical Review Letters.* V.129,I.2, July 2022. doi:10.1103/PhysRevLett.129.021801
3. "First dark matter search results from Coherent CAPTAIN-Mills"
   Aguilar-Arevalo, A.A., Alves, D.S.M., Biedron, S., Boissevain, J., and 46 others including **Elliott, Ashley.** (CCM Collaboration), *Physical Review D*, V.106,I.1, July 2022, doi:10.1103/PhysRevD.106.012001
2. "TOI-530b: a giant planet transiting an M-dwarf detected by TESS"
   Gan, T., Lin, Z., Wang, S.X., Mao, S., Fouqué, P., Fan, J., Bedell, M., and 42 others including **Elliott, Ashley.**, *Monthly Notices of the Royal Astronomical Society*, V.511,I.1, March 2022, doi:10.1093/mnras/stab3708
1. "5 Years of BRITE-Constellation photometry of the luminous blue variable P Cygni: properties of the stochastic low-frequency variable"
   Elliott, Ashley., Richardson, N.D., Pablo, H., Moffat, A.FJ., Bowman, D.M., Ibrahim, N., Handler, G., Lovekin, C., Popwicz, A., St-Louis, N., Wade, G.A., Zwintz, K., *Monthly Notices of the Royal Astronomical Society.* V.509,I.3, January 2022. doi:10.1093/mnras/stab3112

PUBLICATIONS IN PROGRESS

1. "The HD 219134 multi-planet system: A comprehensive analysis"
   Elliott, A., Boyajian, T., Huber, D., Ligi, R., *Publications of the Astronomical Society of Australia*, 2025, in prep

PRESENTED TALKS AND POSTERS

Apr 2025 "One big exoplanet family: A detailed look into the HD 219134 multi-planet system"
Contributed Talk, Virtual, *CHARA Science Meeting*

Apr 2025 "What's new in optical interferometry? An overview of recent results part 2"
Contributed Talk, Louisiana State University, *LSU Department of Physics and Astronomy Astrophysics Seminar*

Mar 2025 "Long baseline Optical Interferometry: What is it and why is it so cool?
Invited Talk, Highland Road Park Observatory, *Baton Rouge Astronomical Society Monthly Meeting*

Oct 2024 "What's new in optical interferometry? An overview of recent results"
Contributed Talk, Louisiana State University, *LSU Department of Physics and Astronomy Astrophysics Seminar*

Apr 2024 "Measuring the Stellar and Planetary Parameters of the 51 Eridani System"
Contributed Talk, Louisiana State University, *LSU Department of Physics and Astronomy Astrophysics Seminar*

Mar 2024 "Measuring the Stellar and Planetary Parameters of the 51 Eridani System"
Contributed Talk, Virtual, *CHARA Science Meeting*

Jul 2023 "LUSTER: LUnar-based Survey for Time-domain Exoplanet Research"
Poster/PoP Presentation, Pasadena, CA, *NEXSci Sagan Summer Workshop*

Mar. 2023 "Measuring the Stellar and Planetary Parameters of the 51 Eridani System"
Contributed Talk, Atlanta, GA, *CHARA Science Meeting*

Jan 2021 "Investigating Large Planet Candidates Around M Dwarf Stars"
iPoster, Virtual, 237$^{\text{th}}$ *AAS Meeting*

Sep 2020 "Investigating Large Planet Candidates Around M Dwarf Stars"
Contributed Talk, Embry-Riddle Aeronautical University - Prescott, *Student Science Speaker Series*

Aug 2020 "Investigating Large Planet Candidates Around M Dwarf Stars"
Contributed Talk, Virtual, *NASA GSFC Intern Presentations*

Jan 2020 "Coherent Captain Mills: The Search for Sterile Neutrinos"
Poster, College Station, TX, *Conference for Undergraduate Women in Physics*

Oct 2019 "Coherent Captain Mills: The Search for Sterile Neutrinos"
Poster, Prescott, AZ, *APS Four Corners Meeting*

Oct 2019 "Coherent Captain Mills: The Search for Sterile Neutrinos"
Invited Talk, Prescott, AZ, *Society of Physics Students Zone Meeting*

Oct 2019 "Coherent Captain Mills: The Search for Sterile Neutrinos"
Poster, Prescott, AZ, *Undergraduate Research Institute Research Symposium*

CONFERENCE ABSTRACTS

3. "Fundamental Properties of Three Metal-Poor Stars with Optical/NIR Interferometry"
Hiegel, E.G., Boyajian, T., **Elliott, Ashley**, 2023, *2023 Fall Meeting of the APS Eastern Great Lakes Section*, (Abstract F01.00057)
2. "Binary Parameters for the Massive Eclipsing binary CC Cassiopeiae"
Richardson, N., Pablo, H., Barclay, K., Beltran, M., Daly, A., **Elliott, Ashley**, and 8 others, 2021, *TESS Science Conference II*
1. "Investigating Large Planet Candidates Around M Dwarf Stars"
Elliott, Ashley, Schlieder, J., 2021, 237$^{\text{th}}$ *AAS Meeting*, (Abstract 546.05)

RESEARCH EXPERIENCE

Louisiana State University **August 2021 - Present**
Department of Physics and Astronomy Advisor: Dr. Tabetha Boyajian
Research Assistant as PhD Candidate

- Directly measuring fundamental properties of exoplanet host stars using optical/near-IR interferometry
- Characterizing exoplanet systems using directly measured fundamental host star properties through the use of EXOFASTv2
- Compiled a status update of directly measured stars, resulting in 693 unique systems (can be seen here)

Embry-Riddle Aeronautical University Prescott **August 2020 - August 2021**
Department of Physics and Astronomy Advisor: Dr. Noel Richardson
Senior Thesis Research as Undergraduate Student

- Performed time series analysis on the luminous blue variable P Cygni with data from the BRIght-star Target Explorer (BRITE) satellite
- Investigated the long term periodicity of P Cygni

NASA Goddard Space Flight Center **June 2020 - August 2020**
The Transiting Exoplanet Survey Satellite (TESS) team Advisor: Dr. Joshua Schlieder
NASA Intern
Funded by the Arizona Space Grant Consortium

- Compiled a list of large planet candidates around M dwarf stars from the TESS Objects of Interest Catalog
- Analyzed the large planet candidate to determine their validity as exoplanets using LIGHTKURVE and ELEANOR
- Vetted sector data for new exoplanets

Embry-Riddle Aeronautical University - Prescott **September 2018 - May 2020**
Department of Physics and Astronomy Advisor: Dr. Darrel Smith
Coherent CAPTAIN-Mills Collaboration at Los Alamos National Laboratory
Research Assistant as Undergraduate Student

- Investigated the background noise sources that could adversely affect the Coherent CAPTAIN-Mills (CCM) detector at Los Alamos National Lab
- Monitored the CCM detector during night shifts
- Built a shielding wall for the CCM detector at Los Alamos National Lab

PROPOSALS: GRANTS/PROJECTS

- **NASA FINESST - 2025**
  FI: Pending, "A Detailed Characterization of Exoplanet Host Stars and Their Planets", Duration: 1 year, Budget: $49,807
- **NASA Innovative Advanced Concepts (NIAC) Phase II - 2025**
  Co-I: Pending, "A Lunar Long-Baseline Optical Imaging Interferometer: Artemis-enabled Stellar Imager (AeSI) - Phase II", Duration: 2 years, Budget: $599,992

PROPOSALS: OBSERVATIONS

- **NOIRLab Center for High Angular Resolution Astronomy - 2025A Semester**
  Co-I: Accepted, "Calibrating Surface-Brightness Relationships Using Photometric Standard Stars", 4 nights per semester for 3 semesters to use the MIRC-X beam combiner
- **NOIRLab Center for High Angular Resolution Astronomy - 2024B Semester**
  PI: Declined, "Radii of transiting exoplanet host stars", 2.5 nights to use the PAVO and MIRC-X beam combiners
- **NOIRLab Center for High Angular Resolution Astronomy - 2024A Semester**
  PI: Declined, "Radii of transiting exoplanet host stars", 4 nights to use the PAVO and MIRC-X beam combiners
- **NOIRLab Center for High Angular Resolution Astronomy - 2023B Semester**
  PI: Declined, "Radii of transiting exoplanet host stars", 6 nights to use the PAVO and MIRC-X beam combiners

OBSERVING EXPERIENCE

- **Optical/Near-Infrared Interferometers**: 17 nights of observing time using the PAVO, Classic, and MIRC-X/Mystic beam combiners at the Center for High Angular Resolution Astronomy (CHARA) Array (observed in person and remotely; 2022, 2025)
- **Optical Telescopes**: Observed using the Highland Road Park Observatory in Baton Rouge, Louisiana for the Observational Astronomy lab course as a part of required graduate courses
  Observed using the Embry-Riddle Aeronautical University, Prescott Observatory Complex in Prescott, Arizona for the Observational Techniques course as a part of required undergraduate courses

PUBLIC TALKS

4. **Invited Speaker** at the LSU Society of Physics meeting (October 21^{st}, 2024) to discuss Earth's temporary second moon
3. **Headliner for Astronomy on Tap** in Baton Rouge, Louisiana at the Varsity Theater (July 25th, 2024) `https://www.youtube.com/watch?v=0goORXqOlUk`
2. **Headliner for Astronomy on Tap** in Baton Rouge, Louisiana at the Varsity Theater (February 28th, 2024) `https://www.youtube.com/watch?v=dmuXmiPanKE`
1. **Headliner for Astronomy on Tap** in Baton Rouge, Louisiana at the Varsity Theater (May 29th, 2023) `https://www.youtube.com/watch?v=7n9FWq_iauU`

TEACHING & PUBLIC OUTREACH

Astronomy on Tap, Baton Rouge

- **Lead Organizer (September 2021 - January 2024)**
  In charge of running the organization, including: finding speakers, communicating with the venue, communicating with the speakers, creating introduction content played during the show intro, creating trivia for each show, doing inventory, ordering supplies, organizing volunteers for each show, setting up for each show at the venue, and additional responsibilities for each show on a monthly basis. I also was a part of the main organizing committee for the Astronomy on Tap show held during the 243^{rd} AAS meeting in New Orleans, Louisiana.
- **Emcee (September 2021 - January 2024)**
  I hosted each show on a monthly basis. I also emceed the largest Astronomy on Tap show ($\sim$ 700 people) at the 243^{rd} AAS meeting, held at the Republic NOLA venue, in New Orleans, Louisiana.
- **General Volunteer (January 2024 - Current)**
  I create the trivia for intermission and introduction content played during each show intro. I also create the tip challenges for each show. I also fill in for additional responsibilities if needed.

Cadette Space Science Researcher Girl Scout Events

- **Organizer** for the Cadette Space Science Researcher Girl Scout Badge Event with local Girl Scout troops in Baton Rouge, LA in January 2023 and January 2024. Taught Girl Scouts about astronomy and space by leading them through activities like light through prisms, star sorting, and light pollution.

Letters to a Pre-Scientist

- **Pen-pal** to a "pre-scientist" through the *Letters to a Pre-Scientist* program (September 2023-May 2024): wrote letters to a middle-school student to encourage them to pursue STEM, answer their questions about my field of study, being a woman in STEM, and other topics.

Planetarium Shows

- **Creator** of the "Our Friends the Planets" kid-friendly planetarium show at the Jim and Linda Lee Planetarium in Prescott, AZ. I coded, scripted, and live performed the show to teach children under the age of 6 about the solar system. I also led the children in science demo activities after the show.

Teaching Assistant

- **Introduction to Astronomy Lab at LSU (August 2021 - May 2022)**
  Taught 2, 2 hour labs a week for non-science major students on basic astronomy topics, including star lifecycles, telescope use, and gravitational waves. I, personally, rewrote all 10 labs to make the material more understandable to students and more effective during the summer of 2024. I also trained all incoming astronomy lab TAs on the new material.
- **Grader for Astronomy Courses at LSU (August 2022 - May 2023)**
  Graded for Intro to Astronomy for non-science major students, Astrophysics 1 and 2 for Physics and Astronomy major students, and Intro to Astronomy for Physics and Astronomy major students. I also provided tutoring and office hour sessions for each course.
- **Physics Labs at ERAU (August 2018-May 2021)**
  Taught the Intro to Physics 1 and 2 labs for the physics majors, Engineering Physics Labs for engineers, Modern Physics lab for physics majors, and Optics lab for physics majors. Each lab was twice a week for 3 hours, plus additional office hours per week.
- **Head Physics Lab Teaching Assistant at ERAU (2019-2021)**
  Responsibilities included: conducting monthly meetings of the Physics lab TAs, assisting in the hiring of new TAs, training new TAs, scheduling the TA duties, assisting all TAs when need, and keeping track of equipment needed for each lab.

ACADEMIC SERVICE

LSU Department of Physics and Astronomy Graduate Student Organization (GSO)

- **President** of the GSO (2022 - 2023): responsibilities included facilitating the monthly meetings of the GSO, delegating tasks to other officers, and running the graduate student Discord server. Additionally, I organized surveys to gather opinions on university-wide policies and department-wide policies, helped create a new position within the GSO called the International Student Liaison to help support the international graduate students, helped organize the grad students Open House in March and hosted several fundraisers.
- **Vice President** of the GSO (2023-2024): responsibilities included meeting with the faculty once a month to discuss changes in the department, issues the graduate students are facing, updates from the GSO, and any other relevant topics, and providing support to other officers. I, personally, organized a Department Fall Festival, a department Trick-or-Treating event to encourage graduate students to meet new faculty, started a

snack-shop, created a t-shirt design competition, facilitated surveys about the qualifying exam, the graduate statistical mechanics course, and helped organize the Open House events. I also wrote a new amendment to the GSO Bylaws, creating a Student Qual Committee that was designed to help facilitate the issues with the qualifying exam that the graduate students have, including typos in the question bank, study sessions with faculty, and equation sheet corrections.

Society of Physics Students (SPS) at Embry-Riddle Aeronautical University

- **Outreach Coordinator (2019-2020)** of SPS: responsibilities included organizing all outreach for the club, such as demo shows. I also helped re-build the SPS chapter at ERAU alongside that year's officer team. I also helped organize and run the SPS Zone Meeting in 2019.
- **President (2020-2021)** of SPS: responsibilities included facilitating weekly general meetings, running weekly officer meetings, organizing events, and delegating additional tasks.

PROFESSIONAL & ACADEMIC AFFILIATIONS

- American Astronomical Society (AAS): 2020 - Current
- Sigma Pi Sigma: 2020 - Current

SCHOLARSHIPS, FELLOWSHIPS, AND COMPETITIVE AWARDS

Graduate

- Coates Conference Travel Award, $1,200, (2025)
- Louisiana State University Department of Physics and Astronomy Grader of the Year (2021-2022)

Undergraduate

- Embry-Riddle Aeronautical University, Prescott Chancellor's Award (2021)
- Embry-Riddle Aeronautical University, Prescott Outstanding Graduate in Space Physics (2021)
- Embry-Riddle Aeronautical University, Prescott Dean's Scholarship (2017-2021)
- Embry-Riddle Aeronautical University, Prescott Women in Excellence Scholarship (2017-2021)
- Embry-Riddle Aeronautical University, Prescott Student Leadership Scholarship (2019-2021)