Daniel J. Oliver

Email: djo001@uark.edu

Education

University of Arkansas — Fayetteville, AR
Ph. D. in Space and Planetary Sciences; Conc. Gravitational Wave Astrophysics — May 2024
Dissertation Title: *The Gravitational Wave Peep: Improved Modeling of Highly Eccentric EMRIs for LISA Signal Confusion Noise*

University of Arkansas — Fayetteville, AR
Preparing for the Professoriate Microcertificate — December 2022
Interdisciplinary credential designed to help prepare graduate students for teaching, research, and service responsibilities in higher education environments. (9 credit hours)

Oklahoma State University — Stillwater, OK
B.S. Physics, Minor: Philosophy — May 2017
Thesis Title: *Slow Noise in a Laser with Injected Signal*

Professional Experiences

- Visiting Student Researcher, **California Institute of Technology** — March 2023-March 2024
  Invited position working with Theoretical AstroPhysics In Relativity (TAPIR) group at Caltech along with JPL Staff Scientist Dr. Curt Cutler on the development of data analysis tools for LISA
- Niel Bohr International Academy: Summer School on Gravitational Wave Astrophysics, **Niel Bohr Institute at University of Copenhagen** — August 2021
  Five days of activities totaling 38 hours of active participation focusing on data analysis for LIGO, LISA, and Pulsar Timing Arrays
- Summer Internship, **University of Nebraska-Kearney** — Summer 2021
  Advisor: Dr. Joel Berrier
  Work on LISA signal confusion noise project utilizing Illustris Cosmological Simulation to create black hole mass functions.
- Assistant at Mendenhall Observatory, **Oklahoma State University** — Sept. 2014-January 2016
  Advisor: Dr. Peter Shull
  Assisted with fundraising and renovations to the observatory which included hosting observational events using the 24-inch telescope

Workshops

- LISA Sprint, California Institute of Technology (Pasadena, CA) — April 2024
- LISA Analysis Tools Workshop, (Virtual) — April 2024
- Gravitational Wave Astronomy Northwest (GWANW) Student Workshop (Virtual) — June 2021
- Gravitational Wave Early Career Scientists Funding Opportunity Workshop (Virtual) — June 2021
- Workshop on Gravitational Wave Astrophysics for Early Career Scientists (Virtual) — May 2021

Programming

- **Fluent in:** Python, LaTeX, Fortran
- **Experience in:** Mathematica, Matlab, C, C++, C#, HTML, CSS

Awards

- **Executive Award**, from University of Arkansas Graduate and Professional Student Congress (GPSC) — May 2022
  Recognition for outstanding contributions to graduate students and GPSC at the University of Arkansas
- **Lloyd B. Ham Award for Outstanding Teaching Assistant**, from University of Arkansas — May 2021
  Recognition of contributions to teaching in the physics department during the COVID-19 Pandemic
- **Eagle Scout Award**, from Scouting America (Formerly Boy Scouts of America), — November 2008
  Rank that less than 5% of Boy Scouts earn, which requires hundreds of hours spent organizing and performing service projects for local communities amongst other activities.

Outreach and Service

- **Letters to a Pre-Scientist** (LPS) — 2023-Present
  STEM Outreach organization which pairs students ("pre-scientists") from low-income communities with a STEM professional for a year long pen pal program to broaden their awareness to what STEM professionals due and inspire them to explore a future in STEM.
- **Space Hogs,** University of Arkansas — 2018-2022
  STEM Outreach organization which hosted events based in astronomy for local communities and schools in northwest Arkansas. — Vice President (2021-2022)
- **OSU Astro Club**, Oklahoma State University — 2014-2017
  Hosted monthly sky viewings open to the public as well as monthly educational lectures about current astronomical news. — Founding Member; Vice-President (2014-2015); President (2015-2017)
- **Society of Physics Students,** Oklahoma State University — 2014-2017
  Worked to educate local area and university students about physics and astronomy through various outreach events — Secretary (2015-2016); President (2016-2017)

Media Appearances

- Hosted a Science Café, Oklahoma State University. *Astronomy and Physics* — September 20, 2016
- Interview for Stillwater News Press. *Perseids will light up Stillwater* — August 12, 2015
- Interview for Stillwater News Press. *Equinox means equal light* — March 17, 2015

Professional Memberships

- LIGO-VIRGO-KAGRA (LVK) Collaboration, Non-Working Member — 2021-Present
- LISA Consortium, Waveform Working Group — 2021-Present
- North American Nanohertz Observatory for Gravitational Waves (NANOGrav) — 2019-Present
  Associate Member in Detection Working Group
- American Astronomical Society (AAS) — 2018-Present
- American Physical Society (APS) — 2018-Present

Teaching and Mentoring (Head TA Indicated by Bold Semester)

- Physics for Human Affairs (**Lab TA**) — Spring 2023, Fall 2023, Spring 2024
- Intro to Astronomy (**Lab TA**) — Summer 2018, Spring 2019, Summer 2020, Spring 2023, Summer 2023, Fall 2023, Spring 2024

- University Physics II (**Lab TA**) — Spring 2018, **Spring 2021, Summer 2021, Spring 2022,** Fall 2022
- University Physics II (**Lecturer**) — Summer 2022
- Optics (**Lab TA**) — Fall 2018, **Fall 2019, Spring 2020, Fall 2020, Fall 2021, Fall 2022**
- College Physics II (**Lab TA**) — Summer 2019
- University Physics I (**Lab TA**) — Spring 2022

Invited Talks

- **California Institute of Technology**. LIGO Seminar Presentation — June 2023
  "Gravitational Wave Peeps and Their Implication for LISA Data Analysis"

Conference Presentations

- American Physical Society (APS) April Meeting (**Sacramento, CA**) – Oral Paper — April 2024
  "Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA"
- American Physical Society (APS) April Meeting (**Minneapolis, MN**) – Oral Paper — April 2023
  "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA: The Gravitational Wave Peep and Its Implication for Data Analysis"
- Mid-American Regional Astrophysics Conference (MARAC) (**Fayetteville, AR**) – Oral Paper — October 2022
  "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA"
- American Physical Society (APS) April Meeting (**New York, NY**) – Oral Paper — April 2022
  "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA"
- Mid-American Regional Astrophysics Conference (MARAC) (**Virtual**) – Poster — April 2022
  "Improved Modeling of EMRI Signal Confusion Noise for LISA"
- American Physical Society (APS) April Meeting (**Virtual**) – Oral Paper — April 2021
  "Improved Modeling of EMRI Signal Confusion Noise for LISA"
- American Physical Society (APS) April Meeting (**Cancelled due to COVID-19**) – Oral Paper — April 2020
  "Modeling Populations of Highly Eccentric EMRIs for LISA Signal Confusion Noise"
- 9th Gulf Coast Gravity Meeting (**Cancelled due to COVID-19**) – Oral Paper — March 2020
  "Lining Up Your Shots: Capturing the Interesting Part of Highly Eccentric EMRI Gravitational Wave Snapshots"
- American Physical Society (APS) April Meeting (**Denver, CO**) – Poster — April 2019
  "Computation of highly eccentric EMRIs to characterize background confusion noise in LISA"

Publications

D. J. Oliver, A. D. Johnson, L. Janssen, J. Berrier, K. Glampedakis, D. Kennefick, "Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA", (**In Prep**)

D. J. Oliver, A. D. Johnson, J. Berrier, K. Glampedakis, D. Kennefick, "Gravitational Wave Peeps from EMRIs and their Implication for LISA Signal Confusion Noise", Classical and Quantum Gravity, 2024, DOI: 10.1088/1361-6382/ad40f2, arXiv: 2305.05793.