

# DANIEL J. OLIVER

918-575-5671 | [oliverda@oregonstate.edu](mailto:oliverda@oregonstate.edu) | [danieljoliver.com](http://danieljoliver.com) | [github.com/DanielJOLiver](https://github.com/DanielJOLiver) | US Citizen

## 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

### Oklahoma State University

Stillwater, OK

*B.S. Physics, Minor: Philosophy*

May 2017

Thesis Title: Slow Noise in a Laser with Injected Signal

## RESEARCH APPOINTMENTS

---

### NANOGrav Physics Frontiers Center Postdoctoral Research Fellow

Sept. 2024 - Present

*Oregon State University*

Corvallis, OR

- Advisors: Dr. Jeffrey Hazboun & Dr. Xavier Siemens
- Research on pulsar timing array (PTA) datasets, spanning pulsar timing, noise modeling, and gravitational wave detection
- Developing new pulsar timing methodologies to model chromatic effects and improve noise characterization
- Analytical derivation and implementation of PTA sensitivity to anisotropic gravitational wave backgrounds, integrated into existing PTA analysis tools
- Contributing to PTAs at international scale through data combination, timing, and noise analysis for the International Pulsar Timing Array (IPTA) data releases
- Mentoring Ph.D. students in PTA and LISA gravitational wave theory and data analysis, including supervision of projects outside local faculty expertise

### Visiting Student Researcher

March 2023-March 2024

*California Institute of Technology*

Pasadena, CA

- Primary Advisor: Dr. Curt Cutler (Jet Propulsion Laboratory)
- Host Faculty: Dr. Katerina Chatziioannou & Dr. Yanbei Chen (California Institute of Technology)
- Invited research position with the Theoretical AstroPhysics In Relativity (TAPIR) group, collaborating with Jet Propulsion Laboratory staff scientists on the development of LISA data analysis tools
- Independent development of theoretical and data analysis approaches for LISA extreme mass ratio inspirals (EMRIs)

### Summer Internship

May 2021 - August 2021

*University of Nebraska-Kearney*

Kearney, NE

- Advisor: Dr. Joel Berrier
- Developed population modeling code for LISA gravitational wave background studies using black hole mass functions derived from Illustris cosmological simulations
- Collaborated on methods for extracting and validating supermassive black hole mass functions from Illustris, forming the basis of subsequent dissertation work and first-author publications

### Assistant at Mendenhall Observatory

Sept. 2014 - Jan. 2016

*Oklahoma State University*

Stillwater, OK

- Supported operation of a 24-inch research telescope during facility renovations
- Led public and donor observing events, operating the telescope and delivering guided astronomical observations contributing to successful fundraising for long-term observatory repairs and expanded public outreach

## PUBLICATIONS

---

NOTE: Certain publications produced by the NANOGrav and IPTA collaborations have all authors or a subset of the authors listed in alphabetical order. This ordering does not represent the proportion of contributions made to the papers. Publications that I have led or where I have made critical contributions are highlighted in bold. Publications where I have advised or helped to advise students are denoted by \* \* \*.

### 6. **“Analytical Modeling of Pulsar Timing Array Anisotropic Sensitivity”**

**D. J. Oliver**, M. Maggi, K. Gourlie, J. Baier, J. S. Hazboun

(In Prep)

5. **“The NANOGrav 15 yr and 20 yr Datasets: Timing Events and Pulse Shape Changes”**  
B. Jacobson-Bell et al. (62 authors including **D. J. Oliver**).  
(Accepted for publication **The Astrophysical Journal**)
4. **“The NANOGrav 15 yr Data Set: Customized Chromatic Noise Models”**  
B. Larsen, J. G. Baier, **D. J. Oliver**, K. Wayt, J. Simon, J. S. Hazboun, C. M. F. Mingarelli, et al. (54 authors).  
(Accepted for publication **The Astrophysical Journal**)
3. **“The NANOGrav 12.5-year Data Set: Chromatic Noise Characterization & Mitigation with Time-Domain Kernels”**  
J. S. Hazboun, J. Simon, B. Larsen, J. Baier, **D. J. Oliver**, et al. (67 authors), 2026  
*The Astrophysical Journal*, DOI:10.3847/1538-4357/ae4ee0 arXiv: 2511.22597)
2. **“Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA,”**  
**D. J. Oliver**, A. D. Johnson, L. Janssen, J. Berrier, K. Glampedakis, D. Kennefick, 2026  
*Physical Review D*, DOI: 10.1103/kgp7-ymyj, arXiv:2507.19704.
1. **“Gravitational Wave Peeps from EMRIs and their Implication for LISA Signal Confusion Noise,”**  
**D. J. Oliver**, A. D. Johnson, J. Berrier, K. Glampedakis, D. Kennefick, 2024  
*Classical and Quantum Gravity*, DOI: 10.1088/1361-6382/ad40f2, arXiv:2305.05793.

---

#### INVITED TALKS

<b>JPL SVCP Astrophysics Luncheon Seminar</b> <i>NASA Jet Propulsion Laboratory</i> “Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA”	Sept. 2025
<b>LIGO Seminar</b> <i>California Institute of Technology</i> “Gravitational Wave Peeps and Their Implication for LISA Data Analysis”	June 2023

---

#### PUBLIC TALKS

<b>Astronomy on Tap</b> <i>Oregon State University</i> “Gravity Speaks, LISA Listens”	May. 2026
<b>Science Café</b> <i>Oklahoma State University</i> “Astronomy and Physics”	Sept. 2015

---

#### CONFERENCE PRESENTATIONS

<b>American Physical Society (APS) Global Physics Summit</b> <i>Denver, CO</i> Oral Talk: “Forecasting PTA Anisotropy with Analytical Skymaps and Sensitivity Curves”	March 2026
<b>American Astronomical Society (AAS) Winter 247 Meeting</b> <i>Phoenix, AZ</i> Oral Talk: “Analytical Skymaps for PTA Stochastic Background Anisotropy”	January 2026
<b>NANOGrav Fall Meeting</b> <i>Missoula, MT</i> Oral Talk: “Analytical Sensitivity Curves and Skymaps for PTA Stochastic Background Anisotropy”	November 2025
<b>International Pulsar Timing Array Science Meeting</b> <i>Pasadena, CA</i> Oral Talk: “Building PTA Sensitivity Curves for Stochastic Background Anisotropy”	June 2025
<b>American Physical Society (APS) Global Physics Summit</b> <i>Anaheim, CA</i> Oral Talk: “Building PTA Sensitivity Curves for Stochastic Background Anisotropy”	March 2025

<b>American Astronomical Society (AAS) Winter 245 Meeting</b> <i>National Harbor, MD</i>	January 2025
Oral Talk: "Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA"	
<b>American Physical Society (APS) April Meeting</b> <i>Sacramento, CA</i>	April 2024
Oral Talk: "Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA"	
<b>American Physical Society (APS) April Meeting</b> <i>Minneapolis, MN</i>	April 2023
Oral Talk: "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA: The Gravitational Wave Peep and Its Implication for Data Analysis"	
<b>Mid-American Regional Astrophysics Conference (MARAC)</b> <i>Fayetteville, AR</i>	October 2022
Oral Talk: "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA"	
<b>American Physical Society (APS) April Meeting</b> <i>New York, NY</i>	April 2022
Oral Talk: "Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA"	
<b>Mid-American Regional Astrophysics Conference (MARAC)</b> <i>Virtual</i>	April 2022
Poster: "Improved Modeling of EMRI Signal Confusion Noise for LISA"	
<b>American Physical Society (APS) April Meeting</b> <i>Virtual</i>	April 2021
Oral Talk: "Improved Modeling of EMRI Signal Confusion Noise for LISA"	
<b>American Physical Society (APS) April Meeting</b> <i>Cancelled Due to COVID-19</i>	April 2020
Oral Talk: "Modeling Populations of Highly Eccentric EMRIs for LISA Signal Confusion Noise"	
<b>9th Gulf Coast Gravity Meeting</b> <i>Cancelled Due to COVID-19</i>	March 2020
Oral Talk: "Lining Up Your Shots: Capturing the Interesting Part of Highly Eccentric EMRI Gravitational Wave Snapshots"	
<b>American Physical Society (APS) April Meeting</b> <i>Denver, CO</i>	April 2019
Poster: "Computation of highly eccentric EMRIs to characterize background confusion noise in LISA"	

## MENTORING

---

### Oregon State University

<b>Katelyn Glasby</b>	2024-Present, Ph.D.
• "Orphan Memory Rates for MBHBHs in LISA"	

### University of Arkansas

<b>Harry O'Mara</b>	2024-Present, Ph.D.
• "Decomposition of Overlapping Galactic Binaries in LISA Data"	

## TEACHING

---

### University of Arkansas

<b>PHYS 2074 University Physics II</b>	Lecturer
<ul style="list-style-type: none"><li>• Instructor of record for a calculus-based electricity and magnetism course (Summer 2022)</li><li>• Designed and delivered all lectures; developed all homework assignments, exams, and supporting course materials</li><li>• Supervised and coordinated a team of six teaching assistants responsible for laboratories and grading</li></ul>	
<b>PHYS 3544 Optics Laboratory</b>	Instructor of Record
<ul style="list-style-type: none"><li>• Instructor of record for a standalone, credit-bearing optics laboratory course</li><li>• Led comprehensive redesign of the laboratory curriculum, transitioning assignments from worksheets to full lab reports</li><li>• Taught and assessed experimental optics across six semesters (Fall 2019-Fall 2022); Co-instructor during initial offering (Fall 2018)</li></ul>	
<b>PHYS 2074L University Physics II</b>	Lab TA
<ul style="list-style-type: none"><li>• <b>Lead TA (3 terms):</b> Spring 2021-Spring 2022</li><li>• Managed instructional operations for a large multi-section laboratory course, supervising 20+ teaching assistants during peak enrollments</li><li>• TA: Spring 2018, Fall 2022</li></ul>	
<b>ASTR/PHYS 2001L Introduction to Astronomy</b>	Lab TA
<ul style="list-style-type: none"><li>• TA: Summer 2018-Spring 2024 (7 terms)</li></ul>	
<b>PHYS 1021L Physics for Human Affairs</b>	Lab TA
<ul style="list-style-type: none"><li>• TA: Spring 2023-Spring 2024</li></ul>	
<b>PHYS 2054L University Physics I</b>	Lab TA
<ul style="list-style-type: none"><li>• TA: Spring 2022</li></ul>	
<b>PHYS 2031L College Physics II</b>	Lab TA
<ul style="list-style-type: none"><li>• TA: Summer 2019</li></ul>	

## PROFESSIONAL DEVELOPMENT

---

<b>Preparing for the Professoriate Graduate Microcertificate</b>	December 2022
<i>University of Arkansas</i>	
<ul style="list-style-type: none"><li>• Graduate-level, interdisciplinary credential administered by the Graduate School and focused on faculty careers in higher education</li><li>• Coursework addressed teaching and learning theory, assessment, research funding and grant development, faculty roles and responsibilities, and equity and inclusion in higher education</li></ul>	

## HONORS & AWARDS

---

<b>Executive Award from Graduate and Professional Student Congress (GPSC)</b>	May 2022
<i>University of Arkansas</i>	
<ul style="list-style-type: none"><li>• Recognition for outstanding contributions to graduate students leadership at the University of Arkansas</li></ul>	
<b>Lloyd B. Ham Award for Outstanding Teaching Assistant</b>	May 2021
<i>University of Arkansas</i>	
<ul style="list-style-type: none"><li>• Recognition for outstanding teaching contributions during the COVID-19 transition to fully online instruction</li></ul>	
<b>LISA Symposium Travel Grant</b>	2026
<i>International LISA Symposium</i>	
<ul style="list-style-type: none"><li>• Competitive travel award (up to \$1,500) supporting attendance and participation in the 16th International LISA Symposium</li></ul>	
<b>Professor Daniel S. Stevens Scholarship Fund</b>	May 2015/May 2016
<i>Oklahoma State University</i>	
<ul style="list-style-type: none"><li>• Departmental scholarship recognizing outstanding undergraduate achievement in physics</li></ul>	
<b>President's Leadership Council</b>	2013-2014
<i>Oklahoma State University</i>	
<ul style="list-style-type: none"><li>• Selective undergraduate leadership award granted based on academic achievement and leadership potential</li></ul>	

## WORKSHOPS

---

LISA Sprint 4	May 2026
NASA Physics of the COSmos (PhysCOS) Early Career Workshop 2	Sept. 2025
LISA Sprint 3	April 2025
NASA Physics of the COSmos (PhysCOS) Early Career Workshop	Nov. 2024
Vanderbilt NANOGrav Hack Week	July 2024
Vanderbilt Initiative in Probes of Extreme Relativity (VIPER) Pulsar Timing Array Summer School	July 2024
LISA Sprint 2	April 2024
LISA Analysis Tools Workshop	April 2024
Niels Bohr International Academy: Summer School on Gravitational Wave Astrophysics	August 2021
<ul style="list-style-type: none"><li>Intensive summer school on gravitational-wave data analysis for LIGO, LISA, and pulsar timing arrays (38 hours of active participation)</li></ul>	
Gravitational Wave Astronomy Northwest (Gwanw) Student Workshop	June 2021
Gravitational Wave Early Career Scientists Funding Opportunity Workshop	June 2021
Workshop on Gravitational Wave Astrophysics for Early Career Scientists	May 2021

## OUTREACH AND SERVICE

---

Journal Referee	2025-Present
<ul style="list-style-type: none"><li>Physical Review Letters, Monthly Notices of the Royal Astronomical Society</li></ul>	
NASA Physics of the COSmos (PhysCOS)	2025-Present
<ul style="list-style-type: none"><li>Represented NASA LISA science at American Astronomical Society and American Physical Society conferences through PhysCOS outreach initiatives</li></ul>	
Gravitational Wave Collaborations (NANOGrav, LIGO-Virgo-KAGRA, LISA Science Consortium)	2023-Present
<ul style="list-style-type: none"><li>Coordinated public outreach for multiple gravitational-wave collaborations at major scientific conferences</li></ul>	
Astronomy on Tap	2024-Present
<ul style="list-style-type: none"><li>Co-Organizer of the Corvallis, Oregon Astronomy on Tap chapter</li></ul>	
Letters to a Pre-Scientist (LPS)	2023-Present
<ul style="list-style-type: none"><li>Participated in a year-long STEM mentoring program pairing low-income middle school students with STEM professionals</li></ul>	
Space Hogs (University of Arkansas)	2018-2022
<ul style="list-style-type: none"><li>Vice-President (2021-2022); led astronomy-focused outreach events for local schools and communities</li></ul>	
OSU Astro Club (Oklahoma State University)	2014-2017
<ul style="list-style-type: none"><li>Founding member and President (2015-2017); organized public observing nights and astronomy lectures</li></ul>	
Society of Physics Students (Oklahoma State University)	2014-2017
<ul style="list-style-type: none"><li>President (2016-2017); organized physics outreach events for students and local communities</li></ul>	

## CONFERENCE & WORKSHOP ORGANIZATION

---

Gravitational Wave Investigative Science Experience (GravWISE)	August 2025
<ul style="list-style-type: none"><li>Co-organized undergraduate research workshop supporting transfer students entering four-year institutions</li><li>Delivered instructional lecture on gravitational waveform modeling</li><li>Mentored student-led research projects focused on single-pulsar noise analysis</li></ul>	
LISA Sprint 2	April 2024
<ul style="list-style-type: none"><li>Member of the local organizing group for an international collaborative workshop on LISA data analysis methods at Caltech</li></ul>	

## PROFESSIONAL MEMBERSHIPS

---

<b>North American Nanohertz Observatory for Gravitational Waves (NANOGrav)</b> <ul style="list-style-type: none"><li>• Full Member</li></ul>	2020-Present
<b>International Pulsar Timing Array (IPTA)</b>	2024-Present
<b>LISA Science Consortium</b> <ul style="list-style-type: none"><li>• Community Member</li></ul>	2021-Present
<b>NASA Physics of the COSmos (PhysCOS)</b> <ul style="list-style-type: none"><li>• Gravitational Wave Science Interest Group (GW SIG)</li><li>• Habitable Worlds Science Interest Group (HWO SIG)</li></ul>	2024-Present
<b>LIGO-VIRGO-KAGRA (LVK) Collaboration</b>	2021-Present
<b>American Astronomical Society (AAS)</b>	2018-Present
<b>American Physical Society (APS)</b>	2018-Present

## MEDIA APPEARANCES

---

<b>Interview for Stillwater News Press</b> <i>Perseids will light up Stillwater</i>	August 12, 2015
<b>Interview for Stillwater News Press</b> <i>Equinox means equal light</i>	March 17, 2015