

DANIEL J. OLIVER

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EDUCATION

University of Arkansas

Fayetteville, AR

Ph.D. in Space and Planetary Sciences; Concentration in 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

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.

Manuscripts in Preparation

2. **“Detectability of Extreme Mass Ratio Inspirals in LISA That Merge Beyond the Mission Lifetime”**
D. J. Oliver, A. D. Johnson, J. Thompson, C. Cutler
(In Prep)
1. **“Directional Anisotropic Sensitivity Curves for Pulsar Timing Arrays”**
D. J. Oliver, J. S. Hazboun, M. Maggi, J. Baier, K. Gourlie
(In Prep)

Submitted

2. **“Mitigating the Timing Impact of Anomalous Pulse Profile Shape Variability in PSR J1713+0747 with Gaussian Component Modeling”**
S. A. Nichols et al. (34 authors including D. J. Oliver), 2026
(Submitted to *The Astrophysical Journal*), arXiv:2607.12038.
1. **“The NANOGrav 15 yr Data Set: Impacts of Customized Chromatic Noise Models on Gravitational Wave Analyses”**
N. Agarwal et al. (123 authors including D. J. Oliver), 2026
(Submitted to *The Astrophysical Journal*), arXiv:2606.28554.

Published

5. **“The NANOGrav 15 yr and 20 yr Datasets: Timing Events and Pulse Shape Changes”**
B. Jacobson-Bell et al. (64 authors including D. J. Oliver), 2026
ApJ, DOI:10.3847/1538-4357/ae6db6, arXiv:2604.05453.
4. **“The NANOGrav 15 yr Dataset: Customized Chromatic Noise Models”**
B. Larsen, J. G. Baier, D. J. Oliver, K. Wayt, Y.-T. Chang, J. S. Hazboun, C. M. F. Mingarelli, et al. (56 authors), 2026
ApJ, DOI:10.3847/1538-4357/ae677c, arXiv:2606.28571.
3. **“The NANOGrav 12.5 yr Dataset: Chromatic Noise Characterization and Mitigation with Time-domain Kernels”**
J. S. Hazboun, J. Simon, J. Baier, B. Larsen, D. J. Oliver, P. T. Baker, B. Bécsy, et al. (67 authors), 2026
ApJ, 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
Phys. Rev. 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
Class. Quantum Grav., DOI:10.1088/1361-6382/ad40f2, arXiv:2305.05793.

INVITED TALKS

Northwest Section American Physical Society Meeting <i>Klamath Falls, OR</i> Plenary Talk: “From Pulsar Timing to Gravitational Wave Detection with NANOGrav”	June 2026
LISA Monday Science Call <i>LISA Consortium</i> “Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA”	June 2026
JPL SVCP Astrophysics Luncheon Seminar <i>NASA Jet Propulsion Laboratory</i> “Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA”	Sept. 2025

LIGO Seminar

June 2023

California Institute of Technology

“Gravitational Wave Peeps and Their Implication for LISA Data Analysis”

PUBLIC TALKS**Astronomy on Tap**

May 2026

Oregon State University

“Gravity Speaks, LISA Listens”

Science Café

Sept. 2015

Oklahoma State University

“Astronomy and Physics”

CONFERENCE PRESENTATIONS**16th International LISA Symposium**

June 2026

College Park, MD

Oral Talk: “Detectability of Extreme Mass Ratio Inspirals in LISA That Merge Beyond the Mission Lifetime”

American Physical Society (APS) Global Physics Summit

March 2026

Denver, CO

Oral Talk: “Forecasting PTA Anisotropy with Analytical Skymaps and Sensitivity Curves”

American Astronomical Society (AAS) Winter 247 Meeting

Jan. 2026

Phoenix, AZ

Oral Talk: “Analytical Skymaps for PTA Stochastic Background Anisotropy”

NANOGrav Fall Meeting

Nov. 2025

Missoula, MT

Oral Talk: “Analytical Sensitivity Curves and Skymaps for PTA Stochastic Background Anisotropy”

International Pulsar Timing Array Science Meeting

June 2025

Pasadena, CA

Oral Talk: “Building PTA Sensitivity Curves for Stochastic Background Anisotropy”

American Physical Society (APS) Global Physics Summit

March 2025

Anaheim, CA

Oral Talk: “Building PTA Sensitivity Curves for Stochastic Background Anisotropy”

American Astronomical Society (AAS) Winter 245 Meeting

Jan. 2025

National Harbor, MD

Oral Talk: “Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA”

American Physical Society (APS) April Meeting

April 2024

Sacramento, CA

Oral Talk: “Gravitational Wave Peep Contributions to Background Signal Confusion Noise for LISA”

American Physical Society (APS) April Meeting

April 2023

Minneapolis, MN

Oral Talk: “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)

Oct. 2022

Fayetteville, AR

Oral Talk: “Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA”

American Physical Society (APS) April Meeting

April 2022

New York, NY

Oral Talk: “Improved Modeling of Highly Eccentric EMRI Signal Confusion Noise for LISA”

Mid-American Regional Astrophysics Conference (MARAC)

April 2022

Virtual

Poster: “Improved Modeling of EMRI Signal Confusion Noise for LISA”

American Physical Society (APS) April Meeting <i>Virtual</i>	April 2021
Oral Talk: "Improved Modeling of EMRI Signal Confusion Noise for LISA"	
American Physical Society (APS) April Meeting <i>Cancelled Due to COVID-19</i>	April 2020
Oral Talk: "Modeling Populations of Highly Eccentric EMRIs for LISA Signal Confusion Noise"	
9th Gulf Coast Gravity Meeting <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"	
American Physical Society (APS) April Meeting <i>Denver, CO</i>	April 2019
Poster: "Computation of highly eccentric EMRIs to characterize background confusion noise in LISA"	

MENTORING

Oregon State University

Katelyn Glasby	2024-Present, Ph.D.
• "Orphan Memory Rates for MBHBHs in LISA"	
Martine Maggi	2024-Present, Ph.D.
• "Directional Anisotropic Sensitivity Curves for Pulsar Timing Arrays" (in preparation; third author)	
Kyle Gourlie	2024-Present, B.S.
• First-author project on Fisher Information Matrix approach to sensitivity-curve calculations (in preparation)	
• Contributor to Directional Anisotropic Sensitivity Curves for Pulsar Timing Arrays (Oliver et al., in preparation)	

University of Arkansas

Harry O'Mara	2024-Present, Ph.D.
• "Decomposition of Overlapping Galactic Binaries in LISA Data" (in preparation)	

TEACHING

University of Arkansas

PHYS 2074 University Physics II	Lecturer
• Instructor of record for a calculus-based electricity and magnetism course (Summer 2022)	
• Designed and delivered all lectures; developed all homework assignments, exams, and supporting course materials	
• Supervised and coordinated a team of six teaching assistants responsible for laboratories and grading	
PHYS 3544 Optics Laboratory	Instructor of Record
• Instructor of record for a standalone, credit-bearing optics laboratory course	
• Led comprehensive redesign of the laboratory curriculum, transitioning assignments from worksheets to full lab reports	
• Taught and assessed experimental optics across six semesters (Fall 2019-Fall 2022); Co-instructor during initial offering (Fall 2018)	
PHYS 2074L University Physics II	Lab TA
• Lead TA (3 terms): Spring 2021-Spring 2022	
• Managed instructional operations for a large multi-section laboratory course, supervising 20+ teaching assistants during peak enrollments	
• TA: Spring 2018, Fall 2022	
ASTR/PHYS 2001L Introduction to Astronomy	Lab TA
• TA: Summer 2018-Spring 2024 (7 terms)	
PHYS 1021L Physics for Human Affairs	Lab TA
• TA: Spring 2023-Spring 2024	
PHYS 2054L University Physics I	Lab TA
• TA: Spring 2022	
PHYS 2031L College Physics II	Lab TA
• TA: Summer 2019	

PROFESSIONAL DEVELOPMENT

Preparing for the Professoriate Graduate Microcertificate

December 2022

University of Arkansas

- Graduate-level, interdisciplinary credential administered by the Graduate School and focused on faculty careers in higher education (9 credit hours)
- Coursework addressed teaching and learning theory, assessment, research funding and grant development, faculty roles and responsibilities, and equity and inclusion in higher education

HONORS & AWARDS

LISA Symposium Travel Grant

2026

International LISA Symposium

- Competitive travel award (up to \$1,500) supporting attendance and participation in the 16th International LISA Symposium

Executive Award from Graduate and Professional Student Congress (GPSC)

May 2022

University of Arkansas

- Recognition for outstanding contributions to graduate students leadership at the University of Arkansas

Lloyd B. Ham Award for Outstanding Teaching Assistant

May 2021

University of Arkansas

- Recognition for outstanding teaching contributions during the COVID-19 transition to fully online instruction

Professor Daniel S. Stevens Scholarship Fund

May 2015/May 2016

Oklahoma State University

- Departmental scholarship recognizing outstanding undergraduate achievement in physics

President's Leadership Council

2013-2014

Oklahoma State University

- Selective undergraduate leadership award granted based on academic achievement and leadership potential

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

- Intensive summer school on gravitational-wave data analysis for LIGO, LISA, and pulsar timing arrays (38 hours of active participation)

Gravitational Wave Astronomy Northwest (GWAANW) 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

PROFESSIONAL SERVICE

Journal Referee

2025-Present

- Physical Review Letters, Physical Review D, Monthly Notices of the Royal Astronomical Society

OUTREACH

NASA Physics of the COSmos (PhysCOS)	2025-Present
• Represented NASA LISA science at American Astronomical Society and American Physical Society conferences through PhysCOS outreach initiatives	
Gravitational Wave Collaborations (NANOGrav, LIGO-Virgo-KAGRA, LISA Science Consortium)	2023-Present
• Coordinated public outreach for multiple gravitational-wave collaborations at major scientific conferences	
Astronomy on Tap	2024-Present
• Co-Organizer of the Corvallis, Oregon Astronomy on Tap chapter	
Letters to a Pre-Scientist (LPS)	2023-Present
• A year-long STEM mentoring program pairing low-income middle school students with STEM professionals	
Space Hogs (University of Arkansas)	2018-2022
• Vice-President (2021-2022); led astronomy-focused outreach events for local schools and communities	
OSU Astro Club (Oklahoma State University)	2014-2017
• Founding member and President (2015-2017); organized public observing nights and astronomy lectures	
Society of Physics Students (Oklahoma State University)	2014-2017
• President (2016-2017); organized physics outreach events for students and local communities	

CONFERENCE & WORKSHOP ORGANIZATION

Gravitational Wave Investigative Science Experience (GravWISE)	August 2025
• Co-organized undergraduate research workshop supporting transfer students entering four-year institutions • Delivered instructional lecture on gravitational waveform modeling • Mentored student-led research projects focused on single-pulsar noise analysis	
LISA Sprint 2	April 2024
• Member of the local organizing group for an international collaborative workshop on LISA data analysis methods at Caltech	

PROFESSIONAL MEMBERSHIPS

North American Nanohertz Observatory for Gravitational Waves (NANOGrav)	2020-Present
• Full Member	
International Pulsar Timing Array (IPTA)	2024-Present
LISA Science Consortium	2021-Present
• Community Member	
NASA Physics of the COSmos (PhysCOS)	2024-Present
• Gravitational Wave Science Interest Group (GW SIG) • Habitable Worlds Science Interest Group (HWO SIG)	
LIGO-VIRGO-KAGRA (LVK) Collaboration	2021-Present
American Astronomical Society (AAS)	2018-Present
American Physical Society (APS)	2018-Present