JESSICA LAWRENCE

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EDUCATION

Ph.D., Physics, Texas Tech University — Aug. 2025
M.S., Physics, Texas Tech University — 2021
B.S., Physics (Cum Laude), Texas A&M University — 2019
Minors in Astrophysics & Mathematics

SPECIALIZATION

Searches for astrophysical stochastic gravitational-wave backgrounds with LIGO, Virgo, and KAGRA detectors.

TEACHING EXPERIENCE

Graduate Part-Time Instructor — Texas Tech University
PHYS 1404 – General Physics II — Fall 2023, Spring 2024, Fall 2024

Teaching Assistant — Texas Tech University
PHYS 1408 – Principles of Physics I — Spring 2020, Spring 2022
PHYS 1403 – General Physics I — Fall 2019

ACADEMIC AND PROFESSIONAL EXPERIENCE

Graduate Part-Time Instructor — Aug. 2023 - May 2024
Department of Physics and Astronomy, Texas Tech University — Aug. 2024 - Present

Instructor of record for undergraduate course General Physics II. Develop and deliver engaging lectures. Foster a positive and inclusive learning environment, encouraging student participation and discussion. Construct assessments including exams, quizzes, and homework assignments to evaluate students' learning outcomes. Maintain accurate records of student attendance and grades, utilizing official record-keeping systems.

Research Assistant — Sept. 2020 - Aug. 2023
Department of Physics and Astronomy, Texas Tech University — June 2024 - Aug. 2024
Advisor: Dr. Joseph Romano

Develop a new method to study the astrophysical stochastic gravitational wave background originating from binary black hole mergers using Bayesian Inference. Construct python pipeline to simulate data and perform analysis. Collaborate with domestic and international colleagues on a weekly basis.

Teaching Assistant — Aug. 2019 - May 2020
Department of Physics and Astronomy, Texas Tech University — Jan. 2022 - May 2022

Lead recitation and lab for students enrolled in General Physics I (Fall 2019) and Principles in Physics I (Spring 2020, Spring 2022). Graded homework and lab assignments for assigned sections. Held office hours every week, frequently attended by my students.

Curriculum Developer Nov. 2021 - Dec. 2023
Department of Physics and Astronomy, Texas Tech University
STEM Center for Outreach, Research & Education, Texas Tech University
Center for Integration of STEM Education and Research, Texas Tech University

Developed a set of astronomy traveling labs for middle school (6th-8th grade) science which align with the Texas Educational standards of instruction. Through the labs, students utilize the SKYNET robotic telescope network which has an easy-to-use setup to submit observations and do basic data analysis. The labs are checked out and sent to teachers in the West Texas area.

Supplemental Instruction Supervisor Assistant Jan. 2018 - May 2019
Academic Success Center, Texas A&M University

Observed, evaluated, and supervised a group of Supplemental Instruction (SI) Leaders throughout the semester. Worked closely with supervisor and other assistants to assist and support my SI group. Collected attendance records, approved timesheets, and entered data into system.

Supplemental Instruction Leader Jan. 2017 - May 2019
Academic Success Center, Texas A&M University

Planned, created worksheets for, and lead evening review sessions three nights per week for undergraduate students enrolled in Mechanics (PHYS 218) and College Physics I (PHYS 201). Collaborated with the professor of each class to brainstorm how I could help students better understand concepts and problems.

Tutor Sept. 2016 - Dec. 2016
Academic Success Center, Texas A&M University June 2018 - Aug. 2018

Tutored undergraduate students in Mathematics and Physics courses.

SERVICE

Chapter President – Sigma Pi Sigma Honor Society Aug. 2022 - May 2023
Department of Physics and Astronomy, Texas Tech University

Organized volunteer efforts for outreach events, such as the South Plains Regional Science and Engineering Fair. Worked with faculty advisors to review undergraduate and graduate students for induction eligibility. Planned and coordinated annual induction ceremony and departmental banquet. Managed and supervised annual TTU Department of Physics and Astronomy's Student Poster Competition.

President – Graduate Association of Physicists June 2021 - May 2022
Department of Physics and Astronomy, Texas Tech University

Organized events for physics graduate students, including graduate research talks and TTU Department of Physics and Astronomy's Student Poster Competition. Worked with department chair, faculty advisor, and other student-lead organizations to plan annual departmental banquet. Served as a judge for a local elementary school science fair and for the South Plains Regional Science and Engineering Fair.

Panelist – Conference for Undergraduate Women in Physics (CUWiP) Jan. 2020
College Station, TX

Spoke on multiple panels to answer questions and give advice to undergraduate women in physics about applying to grad school and life in grad school.

Volunteer – Discover, Explore, and Enjoy Physics Sept. 2016 - May 2018
Department of Physics and Astronomy, Texas A&M University

Worked with a team of undergraduate physics and engineering majors to improve and create demonstrations for the Physics Department and the annual Texas A&M University Physics and Engineering Festival, where over 7,000 attendees enjoyed exhibits and lectures.

PROFESSIONAL MEMBERSHIPS

LIGO Scientific Collaboration May 2021 - Present
LISA Consortium Oct. 2020 - Present

HONORS AND AWARDS

Apple Polishing Award, Texas Tech University Mortar Board 2024

Nominated by a former student to receive this award which recognizes influential staff and faculty who exemplify the values of scholarship, leadership, and service–the core ideals of Mortar Board.

Texas Tech University Department of Physics and Astronomy Scholarship 2024
Bucy Graduate Scholarship in Applied Physics 2021 - 2024
Sigma Pi Sigma, Physics National Honor Society 2022
David Howe Graduate Fellowship in Physics 2020
Cynthia Woods Mitchell Undergraduate Scholarship for Women in Physics 2017 - 2018
Stepheni Crawford and Jack Crawford Fellowship in Science 2017
Will Rogers Memorial Scholarship 2017

ADDITIONAL SKILLS AND EXPERIENCE

Academic & Teaching

Instructor of record for 55-85 seat sections
Teaching assistant for 25 seat sections
One-on-one and small group tutoring
Coordinate and develop lab recitation materials
Groundwork Program participant, Texas Tech University Graduate School

Groundwork is a professional development program designed to for graduate students and post-docs to learn about the fundamentals of college teaching, course design principles, classroom management, and active learning strategies.

Programming & Computers

Learning management system: Blackboard and TopHat
Office productivity software: Microsoft Office Suite
Communications platforms: Zoom, Slack, Mattermost, and TeamSpeak
Bash shell scripts
Python proficiency
LaTeX, Mathematica, and Maple

Equipment

Pasco introductory physics lab equipment
Vernier LabPro and LabQuest interfaces, Logger Pro, and related data acquisition equipment
National Instruments interface and related data acquisition equipment

Personal skills
Languages: English, Spanish (advanced beginner)
Great with people
Effective communicator
Organized
Quick learner
Highly motivated

PUBLICATIONS

J. Lawrence, K. Turbang, A. Matas, A. I. Renzini, N. van Remortel, and J. Romano, "A stochastic search for intermittent gravitational-wave backgrounds," Physical Review D 107 (2023).

A. Renzini et al. (34 authors, including **J. Lawrence**) "pygwb: A python-based library for gravitational-wave background searches," The Astrophysical Journal 952, 25 (2023).

ORAL PRESENTATIONS

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "Stochastic Search for Intermittent GWBs," LIGO-Virgo-KAGRA Collaboration Meeting, Barcelona, Spain. (September 24, 2024).

K. Janssens, **J. Lawrence**, M. Lalleman. "Correlated magnetic noise injections," LIGO-Virgo-KAGRA Stochastic Telecon, online. (August 6, 2024).

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "Update of the Stochastic Search for Intermittent GWBs," LIGO-Virgo-KAGRA Collaboration Meeting, Baton Rouge, LA. (March 12, 2024).

A. Renzini, A. Romero, K. Pham, M. Lalleman, C. H. Hsiung, K. Turbang, **J. Lawrence**. "Stochastic F2F Isotropic Update," LIGO-Virgo-KAGRA Collaboration Meeting, Baton Rouge, LA. (March 12, 2024).

J. Lawrence. "Exploring the Popcorn Symphony of Gravitational Waves from Binary Black Hole Mergers," Spring 2024 joint meeting of TSAPS, TAAPT, and Zone 13 SPS, Stephenville, TX. (March 23, 2024).

A. Renzini, M. Lalleman, **J. Lawrence**, "Isotropic Update: 192s vs 128s segment duration investigation," LIGO-Virgo-KAGRA Stochastic Telecon, online. (Jan. 23, 2024).

A. Renzini, A. Romero, A. Macquet, K. Turbang, M. Lalleman, C. H. Hsiung, **J. Lawrence**, K. Janssens, "ER15 Isotropic Analysis," LIGO-Virgo-KAGRA Stochastic Telecon, online. (June 20, 2023).

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "Update of Stochastic Search for Intermittent GWBs," LIGO-Virgo-KAGRA Collaboration Meeting, Evanston, IL. (March 14, 2023).

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, A. Matas, N. van Remortel, J. Romano. "Cross-Correlation Search for Intermittent Backgrounds - Status Update," LIGO-Virgo-KAGRA Collaboration Meeting, online. (September 13, 2022).

J. Lawrence, K. Turbang, A. Matas, A. Renzini, N. van Remortel, J. Romano. "Building a stochastic signal-based search for intermittent GWBs," LIGO Seminar, California Institute of Technology, online. (April 28, 2022).

J. Lawrence, K. Turbang, A. Matas, A. Renzini, N. van Remortel, J. Romano. "Cross-Correlation Search for Intermittent Backgrounds - Status Update," LIGO-Virgo-KAGRA Collaboration Meeting, online. (March 15, 2022).

J. Lawrence, K. Turbang, A. Matas, A. Renzini, N. van Remortel, J. Romano. "Cross-Correlation Search for Intermittent Backgrounds," LIGO-Virgo-KAGRA Collaboration Meeting, online. (September 7, 2021).

POSTER PRESENTATIONS

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "Development of the Stochastic Search for Intermittent GWBs (SSI)," LIGO-Virgo-KAGRA Collaboration Meeting, Baton Rouge, LA. (March 13, 2024).

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "SSI : A stochastic search for intermittent gravitational-wave backgrounds," Texas Tech University Department of Physics and Astronomy Poster Competition, Lubbock, TX. (October 6, 2023).

J. Lawrence, K. Turbang, A. Matas, A. Renzini, N. van Remortel, J. Romano. "Stochastic Search for Intermittent GWBs," Texas Tech University Graduate School Poster Competition, Lubbock, TX. (March 30, 2023).

J. Lawrence, K. Turbang, A. Renzini, A. Macquet, N. van Remortel, J. Romano. "Stochastic Search for Intermittent GWBs," LIGO-Virgo-KAGRA Collaboration Meeting, Evanston, IL. (March 15, 2023).

J. Lawrence, K. Turbang, A. Matas, A. Renzini, N. van Remortel, J. Romano. "A Search for Intermittent Gravitational Wave Backgrounds," Texas Tech University Department of Physics and Astronomy Poster Competition, Lubbock, TX. (September 24, 2021).