

Luis Bichon III, Ph.D.

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EDUCATION

Vanderbilt University

Doctor of Philosophy (Ph.D.), Physics

Thesis: Measurement of elliptic flow of J/ψ mesons in 200 GeV gold ion collisions at RHIC
Audited courses: MS Scientific Computing Toolbox, BS Mathematical Data Science

Nashville, TN
November 1, 2024

Texas State University

Bachelor of Science (B.S.), Honors Physics – Summa Cum Laude; Minor in Applied Mathematics

Thesis: [The Nature of the X-ray Binaries in the Whirlpool Galaxy/M51](#)
Society of Physics Students – President (2017 – 2018)

San Marcos, TX
May 12, 2018

RESEARCH EXPERIENCE

Data Science Project, Social Media Analytics

TikTok Bot

Houston, TX
August 2024 – Present

- Employed Selenium-based web scraping on over 200,000 TikTok accounts, followed by data cleaning and preprocessing using Pandas.
- Applied neural networks with Keras to data mine user behavior and develop a predictive model for "follow-back" likelihood.
- Performed impact analysis on model performance by tracking accuracy and loss metrics across training and validation sets, facilitating targeted adjustments to the neural network architecture and hyperparameters, enhancing predictive capabilities and performance.
- Developed an automated account management system streamlining procedures, such as following, increasing operational efficiency.
- Successfully gaining several 100 followers per week since launch using an increasing "follow-back" efficiency as the core metric.

Graduate Research Assistant

Vanderbilt University

(Hybrid) Nashville, TN
June 2018 – Present

- Analyzed petabyte sized nuclear data sets using numerical methods and the RHIC-Atlas Computing Facility (RACF) in a Unix environment.
- Independently produced a full analysis pipeline, starting with a time-optimized cleaning algorithm to preprocess and purify data sample.
- Developed Monte Carlo simulations to conduct efficiency studies, generate theoretical models, and perform closed-system testing.
- Performed statistical reconstruction with multivariable function fitting to isolate distinct signatures from combinatorial and correlated backgrounds, creating both static and dynamic data visualizations.

Data Scientist Intern

OnChain Alpha

(Remote) Austin, TX
November 2023 – May 2024

- Facilitated mathematical modeling for generating alpha at a Cryptocurrency and DeFi focused hedge fund.
- Utilized MongoDB and Python to implement a net profitable PnL project on the Coinbase Pro BAT order book.
- Employed DeFi based strategies to leverage market inefficiencies and generate yield from lending, borrowing, being liquidity providers in liquidity pools, higher order strategies in aggregators, token launches, and air drops.
- Incorporated a Hamilton-Jacobi-Bellman based reinforcement learning algorithm on an optimizing agent value function with an infinite time horizon to perform high frequency trading through defining optimal bid and ask quotes based on market order impacts.

Department of Energy (DOE): Office of Science Graduate Student Researcher

Los Alamos National Laboratory

Los Alamos, NM
August 2021 – November 2023

- Carefully quantified statistical and systematic uncertainties in measurements employing a variety of analytical methodologies including Bayesian analysis.
- Led the calibration effort for the PHENIX experiment's 2016 dataset, using a combination of stochastic processes and Fourier analysis to ensure accurate measurement of calibration parameters, now accessible to all 535 collaboration members.
- Developed technical writing skills through monthly documentation in the form of reports, analysis notes, and DOE funding requests.
- Awarded "Best Poster in Physics" at the 2023 Los Alamos National Laboratory Student Symposium, chosen from over 200 participants.

TEACHING EXPERIENCE

Graduate Teaching Assistant, Laboratory Instructor

Vanderbilt University

August 2018 – May 2023

- PHYS 1601-L:** University Physics I (Fall 2021 – Spring 2023); **PHYS 1602-L:** University Physics II (Fall 2018 – Spring 2021)
- Prepared laboratory setups for experiments, ensuring all necessary materials, equipment, and safety protocols were in place.
- Monitored and assisted students during lab activities, answering questions, offering troubleshooting support, and maintaining a positive and effective learning environment.
- Instructed and facilitated laboratory sessions via Zoom during the pandemic, providing clear and engaging virtual demonstrations, explanations, and real-time guidance to students.
- Graded laboratory reports, providing constructive feedback on experimental techniques, data analysis, and scientific writing.

- Held weekly office hours to support students with lab material, answer questions, and offer additional guidance on lab assignments.
- Maintained accurate records of student participation, grades, and performance, ensuring timely submission of grades and documentation.

Texas State Learning Assistant Program, Learning Assistant

Texas State University

January 2017 – May 2018

- **PHYS 1430:** Mechanics, Spring 2018; **PHYS 2435:** Waves & Heat, Spring 2017 and Fall 2017
- Facilitated active learning in undergraduate physics classrooms guiding small groups of students through challenging concepts enhancing their understanding of complex topics.
- Promoted student engagement through interactive discussions and problem-solving sessions, encouraging collaborative learning.
- Supported faculty instruction by providing real-time assistance during lectures and classroom activities, reinforcing core concepts and helping students connect theoretical material with practical applications.
- Prepared for weekly sessions by reviewing course materials and collaborating with instructors and fellow Learning Assistants to design and implement active learning strategies.
- Guided students through difficult concepts, encouraging dialogue and questioning to foster deeper understanding and self-directed learning.
- Provided feedback to students on their understanding of course material, offering personalized explanations and additional resources for continued learning.

Student Instructional Assistant, Laboratory Instructor

Texas State University

August 2016 – May 2018

- **PHYS 2425:** Electricity & Magnetism, Fall 2017 and Spring 2018; **PHYS 1141:** General Physics I, Fall 2016 and Fall 2017; **PHYS 2435:** Waves & Heat, Spring 2017

Physics Help Center Tutor

Texas State University

August 2018 – June 2021

- **PHYS 1141/1142:** General Physics I/II, **PHYS 1430:** Mechanics, **PHYS 2425:** Electricity & Magnetism, **PHYS 2435:** Waves & Heat, **PHYS 3320:** Modern Physics, **PHYS 3312:** Introduction to Mathematical Physics, **PHYS 3311:** Classical Mechanics

HONORS & AWARDS

- Graduate Leader Institute Travel Grant June 2024
- Los Alamos National Laboratory Outstanding Student Poster Presentation in Physics August 2023
- Department of Energy: Office of Science Graduate Student Research Award April 2021
- Russell G. Hamilton Graduate Leadership Travel Grant May 2019
- McMinn Summer Research Award June 2018
- LBJ Outstanding Senior Student Award Finalist at Texas State University May 2018
- Outstanding Graduating Senior in Physics at Texas State University April 2018
- Sigma Pi Sigma April 2018
- Robert E. and Frances Anderson Scholarship May 2017

TECHNOLOGIES AND SKILLS

- **Programming Languages and Software:** Python (NumPy, SciPy, Pandas, Matplotlib, Scikit-learn, Keras), SQL, C++ (ROOT, PyROOT), MongoDB, JavaScript (React, jQuery, Swift, Bootstrap), HTML/CSS, Fortran 95, LaTeX, Microsoft Office, Git
- **Data Science:** Experimentation (Statistical A/B Experiments, Counterfactuals, Bayesian Inferences, Synthetic Control), Machine Learning (supervised, unsupervised, regression, classification, random forests, neural networks, LSTM)

KEY PUBLICATIONS

- [Elliptic Flow Measurement of \$J/\psi\$ in PHENIX Au+Au at \$\sqrt{s_{NN}} = 200\$ GeV at Forward Rapidity](#) submitted to Physical Review C. on 14 September 2024
- [Measurements at forward rapidity of elliptic flow of charged hadrons and open-heavy-flavor muons in Au+Au collisions at \$\sqrt{s_{NN}} = 200\$ GeV](#) submitted to Physical Review C. on 07 September 2024
- [Elliptic Flow Measurement of \$J/\psi\$ in PHENIX Run 14 Au+Au at \$\sqrt{s_{NN}} = 200\$ GeV](#) conference proceedings published 10 January 2023

- [X-Ray Binaries in M51 I: Catalog and Statistics](#)
Astrophys. J. 922 (2021) 2, 178 Published 6 September 2021
- [Click here for a full list of publications](#)

POSTERS AND TALKS

- **The 21st International Conference on Strangeness in Quark Matter** (Strangeness in Quark Matter 2024) Forward rapidity elliptic flow measurements in PHENIX Au+Au collisions. Strasbourg, France [\[Talk\]](#)
- **XXXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions** (Quark Matter 2023) Forward rapidity J/ψ azimuthal anisotropy in Au+Au collisions measured by the PHENIX experiment. Houston, Texas [\[Poster\]](#)
- **Los Alamos National Laboratory – Annual Student Symposium** (2023) J/ψ Elliptic Flow in PHENIX Run14 Au+Au at 200 GeV. Los Alamos, New Mexico [\[Poster – Award Winner\]](#)
- **April Meeting of the American Physical Society: Quarks to Cosmos** (2023) Forward rapidity J/ψ azimuthal anisotropy in Au+Au collisions measured by the PHENIX experiment. Minneapolis, Minnesota [\[Talk\]](#)
- **XXIXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions** (Quark Matter 2022) Forward rapidity J/ψ azimuthal anisotropy in Au+Au collisions measured by the PHENIX experiment. Krakow, Poland [\[Talk\]](#)
- **PHENIX Summer School: Junior Talks** (2021) PHENIX Measurement of J/ψ Elliptic Flow in 200 GeV Au+Au Collisions at Forward Rapidity. Virtual Conference [\[Invited Talk\]](#)
- **April Meeting of the American Physical Society: Quarks to Cosmos** (2021) PHENIX Measurement of J/ψ Elliptic Flow in 200 GeV Au+Au Collisions at Forward Rapidity. Virtual Conference [\[Talk\]](#)
- **Fall Meeting of the Division of Nuclear Physics** (2020) PHENIX Measurement of J/ψ Elliptic Flow in 200 GeV Au+Au Collisions at Forward Rapidity. Virtual Conference [\[Talk\]](#)
- **Honors Undergraduate Research Conference** (2018) Nature of the X-ray Binaries in the Whirlpool Galaxy/M51. Texas State University [\[Talk\]](#)
- **231st Meeting of the American Astronomical Society** (2018) Optical Counterparts of X-ray Sources in the Whirlpool Galaxy. Washington, DC [\[Poster\]](#)
- **STEM Undergraduate Research Experience (SURE) Program Presentation** (2017) Analysis of the Whirlpool Galaxy with the Hubble Space Telescope. Texas State University. U.S. Department of Education HSI STEM program (84.031), Award #P031C160036 [\[Poster\]](#)

MEMBERSHIPS AND CLUB ACTIVITY

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| · American Physical Society | August 2020 – Present |
| · PHENIX Collaboration Member | August 2020 – Present |
| · Society of Physics Students at Texas State University – President (2017 – 2018) | August 2016 – Present |
| · Sigma Pi Sigma inducted at Texas State University | April 2017 – Present |
| · Society for Women in Physics at Texas State University | August 2017 – Present |
| · Python Club at Texas State University | August 2016 – May 2018 |
| · Math Club at Lone Star College Tomball – President (2015) | January 2015 – December 2015 |