

EVAN BATTEAS

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EDUCATION

Texas A&M University , College Station, TX B.S. Physics with Honors (Computational Science Track) GPA 3.968 Minors: Mathematics, Astrophysics	May 2025
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HONORS AND AWARDS

Member of Phi Kappa Phi honor society	2023
Dean's List	Fall 2022-Spring 2024
Willard and Anne Levin Foundation Scholarship	Fall 2023-Spring 2024
Phillip and Doris Moses Ranch Fund Scholarship	Fall 2023-Spring 2024
John & Fides Agnolet Endowed Scholarship	Fall 2024-Spring 2025
James G Potter Quasi Endowed Scholarship	Fall 2024-Spring 2025
TAMU Physics Department Faculty Student Achievement Award	2025

- Awarded each year to a graduating senior selected by the faculty for both their academic and research achievements.

Goethe Research Experience Fellowship	July 2025
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RESEARCH BACKGROUND

Research Technician I	September 2025
Texas A&M University Supervisor: Dr. Louis Strigari	- present
➤ Started a new project to do a large Fermipy combined analysis of confirmed dwarf spheroidal galaxies with measured or estimated J-factors, with new Fermi-LAT data, to place constraints on the properties of dark matter.	
➤ Investigate upper limits on velocity-dependent annihilation models, p-wave, d-wave, and Sommerfeld	

Observer in the ChETEC-INFRA Observational School (CHINOS), Vila Lanna Research Advisor: Dr. Camilla Hansen	July 2025
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- CHINOS is a 5-day observational astronomy school where we did remote observation using the Nordic Optical Telescope at La Palma, using its FIES instrument. We had lectures, professional development, and learned the spectral analysis tool WebSME.
- Dr. Camilla Hansen advised our group. Our goal was to obtain spectrographic measurements and derive abundances of two RR Lyrae, De Lac and XZ Cyg.
- We took four data points at different times in each star's period, attempting to catch the rise in luminosity. We then normalized the spectra using a Python program and imported the normalized spectra into WebSME, finding the effective temperature, surface gravity, and abundances from Balmer lines, iron lines, magnesium, and strontium lines.
- As a follow-up, in September, I measured equivalent widths of spectral lines by hand using a program developed by Zdenek Prudil, and we are now working on further analysis of each observation (kinematics and abundances) to compile our findings into a paper

Researcher in the Goethe Research Experience Program (GREP), Goethe University Research Advisor: Dr. Laura Sagunski	May -July 2025
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- Goal: Upgrade the self-interacting dark matter (SIDM) gravothermal fluid simulation code (GravothermalSIDM) to include inelastic scattering, introducing dissipation to the simulation. After that, look at the effects that the dissipation has on the astrophysical distribution of dark matter.

- I am on the Simulation team of a larger collaboration, where the other team is the Quantum team, calculating the dissipative interaction cross section, which my team now uses in our simulation.
- We were invited to give 1 of 2 keynote presentations at the GREP summer reception.
- This project has continued outside of the GREP, where we implemented velocity-dependent cross sections with data from the Quantum team, and are now running simulation with velocity-dependent cross sections to investigate how the particle physics impacts different sizes of halos, we are now working on a manuscript

Researcher in the EXPeriential Learning Opportunity through Research and Exchange (EXPLORE) Program,

Texas A&M University and Alberta University | Research Advisors: Dr. Nassim Bozorgnia and Dr. Louis Strigari

October 2024 –
May 2025

- Goal: Find the mass of the local group using the timing argument with MW M31 analogs.

The 5th iteration of the EXPLORE program, this year's research theme was "Echoes from the Dark Universe." This is an international team of astronomers, collaborating on 6 different research projects, guided by mentors from each participating institution (TAMU, York U, U Alberta, Goethe U, U Tokyo).

- As a part of *The Local Group of galaxies with warm dark matter* team, read papers regarding our research project and present them with my team, worked with team members to achieve our goal of estimating the mass of the local group by finding local group analogs in COCO Warm data, which we used the timing argument with.

Undergraduate Researcher in the Department of Physics and Astronomy,

Texas A&M University | Research Advisors: Dr. Addy Evans, Dr. Louis Strigari, Dr. Nassim Bozorgnia

June 2024 –
September 2025

- Goal: Put upper bounds on the interaction cross section of an annihilating dark matter particle in the region of the LMC.

Applied the Fermipy Python package to process gamma-ray data from the Fermi LAT. Create a counts map of gamma-ray photons, use a DM distribution background model from Augsberg LMC analogue to generate a model, and do statistics with it, fitting an upper limit to the cross section as a function of mass using the 'delta log-likelihood' method.

Undergraduate Researcher in the Munnerlyn Instrumentation Lab (Student Assistant),
Texas A&M University | Research Advisors: Dr. Darren DePoy and Dr. Luke Schmidt

May 2023 –
May 2025

- Designed and built a spectrograph that uses an asymmetric Offner relay, commercially available optics, and 3D printing. *This included designing and optimizing the asymmetrical Offner relay spectrograph in Zemax OpticStudio, writing a program for mirror selection, implementing the full design in Solidworks, 3D printing the components and assembling the spectrograph, and testing and optimizing the optical layout with a point source microscope and a FaroArm.*
- Carried out exoplanet observations at the McDonald Observatory on the 82" using ETSI (Exoplanet Transmission Spectroscopy Imager)
- Worked as part of a team to carry out reconnaissance observations of 21 exoplanet atmospheres measured with the Exoplanet Transmission Spectroscopy Imager (ETSI)

- Attended and presented at weekly lab meetings, weekly journal club

Undergraduate Researcher in the Department of Physics and Astronomy,
Texas A&M University | Research Advisor: Dr. Peter Brown

2021–2022

- Combined spectra from distinct HST gratings to eliminate noise that comes from the edge of the instrument detection limits. Created synthetic photometry of type 1a SNe in the UV region to illustrate the importance of individual k-correction rather than correction from a general template.

This included developing code using Python to bin, sigma clip, and plot UV spectral data obtained from the Swift Satellite, through various filters, and modifying previous programs to combine and weight two distinct but overlapping spectra from different HST gratings, reducing the influence of noise found at the edge of instrument sensitivity. Lastly, a program to calculate photon counts through specific filters from spectral flux and compare and contrast the different filter results was also developed and implemented.

- Participated in professional development sessions; attended weekly astronomy journal club

OUTREACH EXPERIENCE

Discover, Explore, Enjoy, Physics and Engineering (DEEP) Team Member,
Texas A&M University

2022-2023

- Team member, DEEP is an outreach organization to research and develop physics demonstrations, then exhibit them at the annual TAMU Physics Festival. As a part of the Condensed Matter Physics group, I developed the “Self-Siphoning Polymer” demonstration and poster, and a poster for the “Self-Pouring Chain” demonstration, both of which I presented at the Spring 2023 Physics Festival

Physics Festival, presenting Solar Projectors, and Magnetic Slime Volunteer,
Texas A&M University

2024

- Presented solar projectors that projected the sun onto a screen, allowing observations of sunspots and flares. Presented slime embedded with iron filings, causing the slime to become manipulable with magnets.

Society of Physics Students (SPS) Member,
Texas A&M University

2022-2025

- As a member of the TAMU chapter of SPS, I participated in weekly meetings which included lectures from professors, professional development, and social activities

Night of Science Volunteer,
Goethe University, Campus Riedberg

2025

- Volunteered for the Night of Science at Campus Riedberg on June 13th. On the 4th floor of FIAS, physics demonstrations were shown to attendees, which included a particle scattering demonstration, a brachistochrone demonstration, and a linear particle accelerator demonstration

TEACHING AND MENTORING EXPERIENCE

Exam Grader for PHYS 304 , Advanced Electricity & Magnetism 1, Texas A&M University Department of Physics and Astronomy	Fall 2024
Exam Grader for ASTR 314 , Survey of Astronomy, Texas A&M University Department of Physics and Astronomy	Spring 2024
Part-Time Learning Center Assistant Blinn College	Fall 2025-Present
Supplemental Instruction Leader for PHYS 221, Optics and Thermal Physics , Texas A&M University Department of Physics and Astronomy	Fall 2024 & Spring 2025
New Student Mentor Texas A&M University Department of Physics and Astronomy	Summer-Fall 2024

TECHNICAL SKILLS

Java, C#, Python, C++, Fortran; HDL; Unity, Unreal Engine 4/5; Blender, SolidWorks; Zemax Optic Studio; Microsoft Office Suite, Google Suite; Visual Studio Code, Google Colab, Jupyter Notebook; Ubuntu

PRESENTATIONS

Observations of RR Lyrae-like stars DELac & XZ Cyg, CHINOS Final Group Presentations, July 2025
Dissipative Self-Interacting Dark Matter Simulations, GREP Summer Reception, [Keynote Presentation](#), July 2025.

Dissipative Self-Interacting Dark Matter Simulations, GREP Summer Reception, Poster, July 2025.
Asymmetric Offner Spectrograph, LAUNCH Undergraduate Research Poster Session, February 2025.
Long Slit Spectrograph using Asymmetric Offner, LAUNCH Undergraduate Research Poster Session, August 2024.

Long Slit Spectrograph using Asymmetric Offner, Astro-Symposium, Texas A&M University, August 2024

Long Slit Spectrograph using Asymmetric Offner, LAUNCH Undergraduate Research Poster Session, August 2023.

Long Slit Spectrograph using Asymmetric Offner, Astro-Symposium, Texas A&M University, August 2023

Synthetic Photon Counts, Texas Astronomy Undergraduate Research Symposium, November 2022.

Combining Distinct HST Spectra, Astro-Symposium, Texas A&M University, August 2022

PUBLICATIONS

1. *Ultra-Precise Ground-Based Observations Of 21 Exoplanet Atmospheres with the Exoplanet Transmission Spectroscopy Imager*, Ryan J. Oelkers, et al, [The Astronomical Journal](#) **169** (2025) 134. DOI: 10.3847/1538-3881/ada557
2. *Asymmetric Offner Spectrograph*, Texas A&M University, Department of Physics and Astronomy, May 2025 - [Undergraduate Thesis](#)
3. *Dark matter annihilation signals from the Large Magellanic Cloud and its impact on the Milky Way*, Evan Vienneau, Evan Batteas, et al, accepted to the *Journal of Cosmology and Astroparticle Physics*, uploaded to the [arXiv](#) September 2025
4. *Enhancements in velocity-dependent dark matter annihilation in Galactic subhalos*, Odelia Hartl, Evan Vienneau, Evan Batteas, et al, under review in the *Journal of Cosmology and Astroparticle Physics*, uploaded to the [arXiv](#) September 2025
5. *Beyond minimal self-interacting dark matter II: Gravothermal simulations*, Alexander Brisebois, Maximilian Heyne, Lukas Lehmann, Evan Batteas, et al, in preparation
6. *Design of a spectrograph using an asymmetric Offner relay*, Evan Batteas, Luke Schmidt, Jennifer Marshall, Darren Depoy, Erika Cook, in preparation for submission to *Research Notes of AAS*