

# Diego Garza

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## EDUCATION

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The University of California at Santa Cruz	Expected, June 2029
PhD in Astronomy & Astrophysics	GPA: x
The University of Chicago	June 2023
Bachelor of Arts in Physics, Bachelor of Science in Astronomy w/Honors	GPA: 3.67

## RESEARCH EXPERIENCE

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Caustic Properties in Outskirts of Dark Matter Halos	February 2021 – Present
University of Chicago: Dept. of A&A   Supervised by Susmita Adhikari & Andrey Kravtsov	
<ul style="list-style-type: none"><li>Analyze density histories of cold dark matter halos using cold dark matter simulations</li><li>Study phase space structures in solid angle bins to develop an algorithm to identify the splash back radius of cluster-sized dark matter halos in simulations</li></ul>	
Chemo-Dynamic Properties of the Fastest Stars in the Milky Way	June 2022 – Present
UT-Austin: Dept. of Astronomy   Supervised by Keith Hawkins	
<ul style="list-style-type: none"><li>Analyze chemical properties of fast stars in the Galaxy using Gaia DR3 to chemically tag them onto a stellar population</li><li>Analyze MCMC orbit integration of the fastest stars to physically determine their origins</li></ul>	
LADEE Data Analysis of the Lunar Exosphere	June 2022 – August 2022
NASA: Goddard Space Flight Center   Supervised by Orenthal J. Tucker	
<ul style="list-style-type: none"><li>Analyzed how chemical abundances in the Lunar Exosphere changes with respect to local lunar time</li></ul>	
COOL-LAMPS	January 2022 – June 2022
University of Chicago: Dept. of A&A   Supervised by Michael D. Gladders	
<ul style="list-style-type: none"><li>Studied strongly lensed galaxies as part of the “ChicagO Optically-selected Lenses—Located at the Margin of Public Surveys” (COOL-LAMPS) collaboration</li><li>Identified galaxy candidates using extragalactic spectroscopic DECamera Legacy Survey</li><li>Utilized the surface brightness modeling software GALFIT to describe galaxy mass distribution, providing information on stellar population synthesis</li></ul>	
Study of Gaseous Argon Time Projection Chambers	June 2021 – August 2021
Fermi National Accelerator Laboratory   Supervised by David Caratelli & Angela Fava	
<ul style="list-style-type: none"><li>Analyzed setups of gaseous Argon time projection chambers for low energy nuclear recoils using simulation software of Argon ion trajectories into gaseous Argon to model, optimize, and study both position and energy resolution</li><li>Created supplemental research material for electron charge amplification in liquid Argon</li></ul>	

## PUBLICATIONS

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Garza, et. al., *Chemo-Dynamic Properties of the Fastest Stars in the Milky Way using Gaia DR3* RNAAS (2023, in prep)

Garza, et. al., *Caustic Properties in the Outskirts of Dark Matter Halos* MNRAS (2023, in prep)

Gladders, et. al., *COOL LAMPS VII: CJ1604 - Lensed AGN Hosting Galaxy* ApJ (2023, in prep)

## PRESENTATIONS

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*Chemo-Dynamic Properties of the Fastest Stars in the Milky Way using Gaia DR3*

- 241<sup>st</sup> Meeting of the American Astronomical Society, [January 2023](#)
- UT Austin Astronomy Department Summer Poster Session, August 2022

*Caustic Properties in the Outskirts of Dark Matter Halos*

- University of Chicago Undergraduate Research Symposium, May 2022
- Midstates Consortium for Math and Science, November 2021
- Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Diversity in STEM, October 2021

## TEACHING EXPERIENCE

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Teaching Assistant | Computational Techniques in Astrophysics March 2022 – June 2023

- Hold open office hours 5-8 hours weekly helping students on coding projects related to techniques used in everyday astrophysics research including integration techniques, function approximation, Machine Learning, MCMC, and ODEs

Physics Tutor | Department of Physics October 2021 – March 2022

- Hold open hours for peer tutoring aimed at undergraduate students in the introductory physics sequences

## SERVICE, OUTREACH, MENTORSHIP

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SEDS-UChicago Vice President, Treasurer March 2020 – June 2023

- Plan and coordinate weekly meetings, events, and workshops to help students with model rocketry and high-powered rocketry
- Outreach and coordinate logistics to industry professionals to plan for the national conference SpaceVision 2022 hosted at UChicago
- Manage the funds for my school's SEDS chapter. Write and defend grant proposals from SEDS-USA and UChicago Student Government's Financial Committee

Moneythink Mentor November 2019 – June 2023

- Mentor local Chicago high school students on the importance and process of financial literacy. Provide advice on post-graduation plans including college and trade school

SACNAS Secretary, Member October 2020 – June 2022

- Develop events and programming to engage with minority students on campus and take notes during leadership meetings

Kavli Institute Space Explorers Instructor June 2021 – January 2022

- Design, develop, and document summer curriculum for high school students

Odyssey Community Scholars Fellow September 2020 – June 2021

- Write, edit, and develop a First-Generation Low-Income Catalog documenting resources and providing advice from shared experiences at the University of Chicago for incoming students from disadvantaged backgrounds
- Share important issues and suggested solutions with the Dean of Students in the University for the Odyssey Scholar community

## RELEVANT WORK EXPERIENCE

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Tech Staff / John Crerar: Computer Science Instructional Lab Tutor October 2021 – June 2023

- Develop, maintain, and deploy software for over 50 Mac Pros, iMacs, and Mac minis
- Provide technology and hardware support for students

NASA L'SPACE Mission Concept Academy Member January 2021 – May 2021

- Lead science-related proposals for a 55-page preliminary design review and a 30-minute presentation on a theorized mission to Venus's atmosphere in the 50-75 km altitude zone

Argonne National Lab Summer Instructor June 2020 – September 2020

- Adapted the Education Department's Learning Center summer curriculum and programs to a virtual environment
- Developed curriculum design for the All About Energy educational program

## AWARDS & GRANTS

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National Science Foundation: Graduate Research Fellowship Program	2023 – 2028
Regents Fellowship, UC Santa Cruz	2023
Questbridge National College Match Scholar	2019 – 2023
<a href="#">Texas Astronomy Undergraduate Research for Under-represented Students Scholar</a>	2022
Department of Astronomy & Astrophysics Research Award	2022
Jeff Metcalf Grant	2021
Micro-Metcalf Grant	2020
Hispanic Scholarship Fund Scholar	2018

## OBSERVATION EXPERIENCE

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Public Data – Experience with data from Gaia and DECALS  
Magellan Telescope – IMACS Optical Imaging, FIRE/FourStar Near-Infrared (3 Nights)  
McDonald Observatory – Cross-Dispersed Echelle Spectrograph (2 Nights)

## SKILLS

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Programming	Python, C, C++, Bash, SQL/ADQL, Mathematica, LaTeX
Astronomy	Simulations, Data Analysis, Data Reduction
Software	Microsoft Office, Adobe Photoshop, DS9, TOPCAT, GALFIT, Pulse Height Analyzer, Oscilloscope, SRIM
Languages	English, Spanish