

AKAXIA CRUZ

akaxiacruz.com · admcruz@uw.edu

EDUCATION

- University of Washington** *May 2023 (expected)*
Ph.D in Physics – Advisor: Thomas R. Quinn
- University of Washington** *September 2016-Present*
NSF Graduate Research Fellow
- University of Washington** *March 2018*
Masters in Physics
- University of Colorado Boulder** *August 2014*
B.A. in Physics & Mathematics with Distinction
Major GPA: 3.93/4.0

EXPERIENCE

- University of Washington** September 2016 - Present
Research Assistant *Seattle, WA*
- Examines the effects of self-interacting, milli-charged, and dark-U(1) dark matter in Milky Way-like galaxies, galaxy groups and clusters using N-body simulations and analytic calculations.
- Institut D’Astrophysique de Paris** March 2019 - September 2019
NSF GROW Fellow *Paris, France*
- Examined the impact of self-interacting dark matter on supermassive black hole formation and growth.
- Girls Inc. of Metro Denver** December 2015 - 2016
STEM/Eureka! Coordinator *Denver, CO*
- Significantly contributed to the design of 5-year program to mitigate attrition of historically underrepresented minority women in STEM fields.
- Lawrence Berkeley National Laboratory** April 2015 - August 2015
Research Assistant *Berkeley, CA*
- Developed an algorithm to determine angular spread in Cherenkov production for few GeV neutrino interactions using object oriented techniques, C++ and numerical methods.
- Lawrence Berkeley National Laboratory** August 2014 - April 2015
DOE SULI Intern *Berkeley, CA*
- Developed an algorithm to determine the spread in raw Cherenkov photon production for a large collection of mono-energetic neutrino events and **increased computation speed by a factor of 30** compared to using pure Monte Carlo.
- James Frank Institute, University of Chicago** June 2013 - September 2013
REU Research Assistant *Chicago, IL*

- Used the Computer Aided Design (CAD) software Inventor to design a 3D printable Michelson-Morley interferometer and showed 3D material stability is comparable to the commercial equipment used in designing and performing optical experiments to within an order of magnitude.

Laboratory for Atmospheric and Space Physics

June 2012 - April 2013

Research Assistant

Boulder, CO

- Used data from NASA's Cassini mission to quantify the angular response of polyvinylidene fluoride (PVDF) detectors.

PROFESSIONAL PUBLICATIONS

A.Cruz and M. McQuinn (submitted 2022), Astrophysical Plasma Instabilities induced by Long-Range Interacting Dark Matter, arXiv:2202.12464

A.Cruz, J. Werk, T. R. Quinn, B. Shih, A. M. Brooks, Y. Faerman, I. Butsky, N. N. Sanchez, M. Tremmel, A. Pontzen (in prep 2022), Dark Matter, Supermassive Blackholes, and Cold Clumps in the Circumgalactic Medium

I. S. Butsky, J. Werk, K. Tchernyshyov, D. B. Fielding, J. Breneman, D. Piacitelli, T. Quinn, N. N. Sanchez, **A.Cruz**, C. B. Hummels, J. N. Burchett, M. Tremmel (2022), The Impact of Cosmic Rays on the Kinematics of the Circumgalactic Medium, ApJ

A.Cruz, A. Pontzen, M. Volonteri, T. R. Quinn, M. Tremmel, A. M. Brooks, N. N. Sanchez, F. Munshi, A. DiCintio (2021), Self-Interacting Dark Matter and the Delay of Super-Massive Black Hole Growth, MNRAS

N. N. Sanchez, M. Tremmel, J. Werk, A. Pontzen, C. Christensen, T. Quinn, S. Loebman, **A.Cruz** (2021), One-Two Quench: A Double Minor Merger Scenario, ApJ

N. N. Sanchez, J. Werk, M. Tremmel, A. Pontzen, C. Christensen, T. Quinn **A.Cruz** (2019), Not So Heavy Metals: Black Hole Feedback Enriches the Circumgalactic Medium, ApJ

V. Garcia, **A.Cruz** (2016). I am Thriving I am Changing the World, A Resource Guide for Engaging Girls and Young Women in STEM, The Women's Foundation of Colorado

PROFESSIONAL PRESENTATIONS

A.Cruz (2022), Astrophysical Implications of Non-Standard Dark Matter
Ohio State University, Center for Cosmology and Astroparticle Physics (*Third Invitation*)

A.Cruz (2022), Astrophysical Implications of Non-Standard Dark Matter
Research University Alliance Conference, California Institute of Technology

A.Cruz (2022), Simulating Self-Interacting Dark Matter in Galaxy Formation on Frontera
Texas Advance Computing Center

A.Cruz (2022), Dark Matter Physics in Simulations
Simons Foundation Center for Computational Astrophysics, N-Body Workshop (*Invited*)

A.Cruz (2022), Plasma Instabilities induced by Long-Range Interacting Dark Matter
University of Washington, Dark Universe Science Center

A.Cruz (2022), Plasma Instabilities induced by Long-Range Interacting Dark Matter
Ohio State University, Center for Cosmology and Astroparticle Physics (*Invited*)

A.Cruz (2021), Astrophysical Implications of Self-Interacting Dark Matter
Carnegie Observatories (*Invited*)

A.Cruz (2021), Astrophysical Implications of Self-Interacting Dark Matter
University of Arizona (*Invited*)

A.Cruz (2021), Self-Interacting Dark Matter and the Delay of Supermassive Blackhole Growth
N-Body Shop Excellence Conference, N-Body Shop International Collaboration

A.Cruz (2020), Self-Interacting Dark Matter and the Delay of Supermassive Blackhole Growth
Ohio State University (*Invited*)

A.Cruz (2020), Self-Interacting Dark Matter and the Delay of Supermassive Blackhole Growth
Yale University (*Invited*)

A.Cruz (2020), Astrophysical Implications of Non-Standard Dark Matter
Stanford University (*Invited*)

A.Cruz (2020), Astrophysical Implications of Non-Standard Dark Matter
Rutgers University (*Invited*)

A.Cruz (2019), Examining SIDM vs. CDM in L^* -Sized Galaxies
Institut D'Astrophysique de Paris

A.Cruz (2018). How SIDM effects Star Formation in Simulated Milky Way-like Galaxies
UC Santa Cruz Galaxy Workshop

A.Cruz (2016), Neutrino Oscillation and 1 to 10 GeV Neutrino/Nucleon Scattering.
University of Colorado Denver SPS Colloquium (*Invited*)

A.Cruz (2015), Modeling Few-GeV Neutrino Interactions in Water
PINGU Collaboration

A.Cruz (2015), Modeling Few-GeV Neutrino Interactions in Water
Harvard School of Engineering and Applied Sciences (*Invited*)

A.Cruz (2015), Simulation and Examination of Few-GeV Neutrinos in Water
DOE SULI Poster Session

AWARDS, HONORS, AND GRANTS

Research University Alliance Research Exchange, Harvard University (2022)
National Science Foundation (NSF) Graduate Opportunities World Wide Fellow (2019)
Co-PI on NASA High-End Computing Allocation (496,688 SBUs) (2019)
NSF Graduate Research Fellow (2016)
Jack Hodges Award for Excellence in Mathematics (2013)
Honors LEAD Scholar (2011-2014)
Sigma Pi Sigma Physics Honor Society (inducted 2011)
University of Colorado Dean's List (2010-2014)
Outstanding Senior in Mathematics (2010)