Andrew Caruso

Virginia Tech Physics Graduate Student

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LinkedIn Profile   GitHub Repository

Research Interests

My research entails using astrophysical environments, including compact objects and stellar core collapse, to explore new hypothetical particles or to better understand standard model particles, such as neutrinos.

Education

August 2023 - present	**Virginia Tech** - *Physics Ph.D.*
September 2019 - June 2023	**University of California Riverside** - *Physics B.S.*

Experience

August 2023 - present	**Virginia Tech** - *Graduate Researcher*
	• Member of Professor Shunsaku Horiuchi's theoretical astroparticle group
	• Currently pursuing beyond the standard models in astrophysical environments, such as core collapse supernovae and compact objects
August 2023 - present	**Virginia Tech** - *Graduate Teacher Assistant*
	• Teaching general physics lab classes for undergraduate students
	• Providing weekly physics office hours for any undergraduate students
	• Proctoring undergraduate physics midterm and final exams throughout each semester
	• Assisting with local physics outreach events
January 2023 - present	**ParticleBites Website** - *Author*
	• ParticleBites is a website that posts concise articles on topics pertinent to high energy physics for the general public.

July 2024 - August 2024	**QUPIP at KEK**
	• 6 week summer internship via the The International Center for Quantum-field Measurement Systems for Studies of the Universe and Particles (QUP) Internship Program (QUPIP) at the High Energy Accelerator Research Organization (KEK).
	• Extended my advisor, Professor Shunsaku Horiuchi's prediction of the diffuse supernova neutrino background (DSNB), with QUP principal investigator, Dr. Volodymyr Takhistov, and Dr. Tomoya Kinogawa.
	• Will complete a paper with said collaborators on arxiv.org.
January 2021 - June 2023	**University of California Riverside** - *Undergraduate Researcher*
	• Member of an undergraduate team with Professor Anson D'Aloisio on theoretical cosmology (reionization epoch and dark matter)
	• Completed a senior thesis under the supervision of graduate student Christopher Cain, to determine the minimum simulation volume size needed to capture a significant amount of the 21 cm radiation from reionization, for the first time using both results from a radiative transfer simulation and a maximum volume of 1 Gpc/h.
	• Gained UNIX and Python experience
June 2022 - August 2022	**CERN Summer Student Programme** - *Summer Student*
	• 9 week summer internship via the International Research Experience for Students (IRES) at CERN, funded by the U.S. National Science Foundation.
	• Created a Python program to simulate the differential cherenkov radiation counter (CEDAR) for the NA62 experiment (kaon factory) at CERN
	• Completed a paper hosted on the CERN Document Server: "Simulating the CEDAR for the NA62 Experiment"
January 2020 - January 2021	**University of California Riverside** - *Undergraduate Researcher*
	• Member of an undergraduate team with Professor Owen Long on experimental particle physics (proton-proton collisions and super-symmetry)
	• Gained experience with C++, ROOT software from CERN, and text editors (Emacs and VIM)
July 2017 - August 2019	**Palomar Health, Pathmaker Internship** - *Intern*
	• Assisted registered nurses and certified nursing assistants with patient care at the Palomar Medical Center in Escondido, California
	• Approximately 300 hour volunteer service

Skills

Experience with programming languages: C++, Python, Latex and JSON; text editors: Emacs and VIM; softwares: Wolfram Mathematica and ROOT from CERN; and operating systems: MacOS and UNIX

Awards

January 2023	Member of Honor Society
January 2022	University of California Riverside R. Stephen White Endowment Award for outstanding 3rd year undergraduate student
January 2021	University of California Riverside Dean's Honors List
September 2020	Member of the National Society of Leadership and Success
September 2020	University California of Riverside Dean's Honors List