RICCO CABRAL VENTEREA

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EDUCATION

BA Cornell University — Aug 2020 – Present
Astronomy with Astrophysics Concentration
Minor in Physics

RESEARCH EXPERIENCE

Cornell Center for Astrophysics and Planetary Science, Ithaca, NY
Mar 2024 – Present
Student Research Assistant IV
Space Exploration for STEM Inspiration Program
Advisor: Zoey Ponterio

- Develop targeted learning outcomes for elementary school students.

Cornell Center for Astrophysics and Planetary Science, Ithaca, NY Jan 2024 – Present
Student Research Assistant III
Advisors: Professor Nicholas Battaglia, Dr. John Orlowski-Scherer

- Develop database containing asteroid thermal emission flux measurements using AWS.

School of Physics and Astronomy, University of Minnesota, Twin Cities, Minneapolis, MN
Jun 2023 – Present
LIGO Scientific Collaboration
A3D3 AI Institute
Research Assistant
Advisors: William Benoit, Professor Michael Coughlin

- Current work in implementing machine learning algorithms to clean and analyze gravitational wave strain data collected from the Laser Interferometer Gravitational-Wave Observatory Livingston and Hanford sites.
- Generate constant-Q transforms for high signal-to-noise gravitational wave event simulations.
- Developed a user-interface to create distributions of black hole parameter simulations.

Nexus Scholars Program, Cornell University, Ithaca, NY — May 2022 – Jul 2022
Research Assistant
Advisor: Professor Nicholas Battaglia

- Continued full-time research in measuring thermal emission of objects in the asteroid belt.

- Detected large asteroids with a high degree of confidence and generated light curves. Presented results at a symposium.

Department of Astronomy, Cornell University, Ithaca, NY Sep 2021 – Present
Research Assistant
Advisors: Professor Nicholas Battaglia, Dr. John Orlowski-Scherer

- Determined flux measurements from thermal emission data of objects in the asteroid belt. Data collected by the Atacama Cosmology Telescope.

National Aeronautics and Space Administration May 2021 – Aug 2021
Lucy Student Pipeline Accelerator and Competency Enabler
Mission Concept Academy
Astrophysicist

- Submitted a Preliminary Design Review on a science reconnaissance mission for water ice mapping in the lunar South Polar Region.

Summer Student Theoretical Physics Research Session, Brown University, Providence, RI
Jun 2021
Student Researcher
Advisors: Professors Jim Gates, Kory Stiffler, Konstantinos Koutrolikos

- Learned topics in supersymmetry with a mathematical emphasis.
- Covered areas in group theory, Lie algebra, differential geometry, tensor algebra, Lagrangian dynamics, Clifford algebra, gauge theory, and supersymmetry algebra.
- Gained experience in LaTeX.

National Aeronautics and Space Administration Jan 2021 – Apr 2021
Lucy Student Pipeline Accelerator and Competency Enabler
Proposal Writing and Evaluation Experience Academy
Technical Team Member

- Submitted a research proposal on human health and performance in low-earth orbit.

Irondale High School Sep 2019 – Dec 2019
Student Researcher
Advisor: Shane Wood

- Studied the effect of zenith angle on cosmic ray muon flux using the QuarkNet Cosmic Ray Muon Detector. Data collected at Irondale High School.
- Proposed and conducted an experiment in cosmic ray muons.

PUBLICATIONS

Journal Publications

Orlowski-Scherer J., **Venterea R.**, Battaglia N., et al., The Atacama Cosmology Telescope: Millimeter Observations of a Population of Asteroids or: ACTeroids. 2024, ApJ, 964, 2

Venterea R., Orlowski-Scherer J., Næss S., et al., Sub-Millimeter Observations of Asteroids Using the Atacama Cosmology Telescope. 2023, American Astronomical Society Meeting Abstracts, 55, 2:104.12

Venterea R., Ekka U., An Introduction to Quantum Computing. 2022, JURP, 31, 1

Journal Papers in Review

Venterea R., Ekka U., An Analysis of Muon Flux from Angle Variation of the QuarkNet Cosmic Ray Detector. 2023, TPT

Journal Papers in Preparation

Venterea R.C., Orlowski-Scherer J., Battaglia N., et al., The Atacama Cosmology Telescope: Release of A databaSe of millimeTer ObservatioNs of Asteroids Using acT (ASTRONAUT). 2024, ApJS

Marx E., Benoit W., Gunny A., et al., A Machine-learning Pipeline for Real-time Detection of Gravitational Waves from Compact Binary Coalescences. 2024, PRD

Journal Papers in Press

Software

Venterea R.C., Orlowski-Scherer J.. A databaSe for millimeTeR ObservatioNs of Asteroids Using acT (ASTRONAUT). Cornell University; 2023.

Reports

Doku F., Ekka U., **Venterea R**., Executive Summary for the Spread of Misinformation and Levels of Censorship. 2021

Muralidhar A., Medvec M., Fujishima B., et al., Preliminary Design Review - Ad Lunam Hopper. 2021, National Aeronautics and Space Administration Lucy Student Pipeline Accelerator and Competency Enabler Mission Concept Academy

Mota A., Sin J., Garcia S., et al., Astronaut-Friendly 3 in 1 Edible Cutlery to Promote Bone Health. 2021, National Aeronautics and Space Administration Lucy Student Pipeline Accelerator and Competency Enabler Proposal Writing and Evaluation Experience Academy

Magazine Articles in Review

Venterea R., The Importance of Astrosociology. 2021, Astrosociological Insights.

Manuscripts

He Y., **Venterea R.**, Wu X., Food Distribution by Mobile Food Pantries: A Design for Optimized Schedule. 2020

PRESENTATIONS AND INVITED LECTURES

Presentations

Marx E., Benoit W., Gunny A., et al., A machine-learning pipeline for real-time detection of gravitational waves from compact binary coalescences. 2024, APS April Meeting

Venterea R., Millimeter Observations of Asteroids Using the Atacama Cosmology Telescope. 2023, Cornell University Undergraduate Research Poster Forum

Venterea R., Millimeter Observations of Asteroids Using the Atacama Cosmology Telescope. 2023, Cornell Undergraduate Research Board Spring Symposium

Venterea R., Observations of Asteroids with ACT. 2023, University of Rochester 2nd Annual Undergraduate Astronomy Research Seminar

Venterea R., Asteroids and ACT. 2022, Atacama Cosmology Telescope Collaboration Meeting

Venterea R., Looking at Asteroids. 2022, Cornell University Nexus Scholars Program Capstone Presentations

Venterea R., Curvature. 2021, Cornell University DRP Talks

Doku F., Ekka U., **Venterea R**., Problem C: Submitted a Tweet, Now What? 2021, SIMIODE Challenge Using Differential Equations Modeling

Venterea R., A Brief Introduction to Quantum Field Theory. 2021, Cornell University DRP Talks

Muralidhar A., Medvec M., Fujishima B., et al., Team 21 - Ad Lunam. 2021, National Aeronautics and Space Administration Lucy Student Pipeline Accelerator and Competency Enabler Mission Concept Academy PDR Presentation

Doku F., Ekka U., **Venterea R**., Using Quantum Computing to Classify Solar Flares. 2021, HackUTD: The VII Seas

GRANTS

Current Research

GBT/24B-184 (John Orlowski-Scherer)
National Radio Astronomy Observatory
$ *Pending*
August 2024 – December 2024
Investigating Anomalous Flux from the Asteroids (511) Davida and (423) Diotima
Research Assistant

(Nicola Tomassetti)
Fulbright U.S. Student Program
€ 13,800
October 2024 – July 2025
Developing a Web Application for Cosmic-ray and Space Physics Data
Research Assistant

Completed Research

HONORS AND AWARDS

Fulbright U.S. Student Program Finalist 2024 – 2025

Wells Fargo Foundation HSF Scholarship 2023

Discover Scholar at the University of Chicago 2023

Grainger Engineering MERGE Scholar 2023

ASPIRE Illinois Scholar at the University of Illinois Urbana-Champaign 2023

Dean's List of the College of Arts and Sciences for Excellence in Scholarship 2021, 2023

Hispanic Scholarship Fund Scholar 2020 – 2021, 2022 – 2024

Summer Experience Grant 2023

Hispanic Scholarship Fund Finalist 2022 – 2024

Undergraduate Research Fund 2023

Einhorn Discovery Grant 2023

FOCUS Scholar at the Georgia Institute of Technology 2023

Alpha Phi Alpha Fraternity Memorial Scholarship 2020 – 2023

Society of Hispanic Professional Engineers Undergraduate Scholarship 2022 – 2023

Inaugural Session of the Nexus Summer Scholars Program 2022

Meritorious Award for Differential Equations Modeling SIMIODE Challenge 2021

D. E. Shaw Latitude Fellowship 2021

National Name Exchange 2021

COMMUNITY SERVICE

National Institute of Development Advancement Certified Chapter Leader Program
Facilitator, July 2023

National Academic Quiz Tournaments 2023 High School National Championship Tournament
Full-time scorekeeper, May 2023

Nexus Scholars Program Information Session 2023
Student panelist, October 2022

Zooniverse
Citizen scientist, 2022 – 2023

PROFESSIONAL TRAINING

Coursework
Compute Ontario Advanced Research Computing Training, June 2022
Using JupyterLab

Coursework
Compute Ontario Advanced Research Computing Training, June 2022
Introduction to Python

Cornell University, Ithaca, New York, May 2022 – July 2022
Attended weekly meetings in professional development that emphasized career goals and improving communication and research skills

Coursework
SciNet High Performance Computing Consortium, January 2022
Databases in Scientific Computing

Coursework
SciNet High Performance Computing Consortium, January 2022
Introduction to GPU Programming

Coursework
SciNet High Performance Computing Consortium, December 2021
Intro to SciNet, Niagara, and Mist

Coursework
SciNet High Performance Computing Consortium, November 2021
Intro to the Linux Shell

PROFESSIONAL AFFILIATIONS

American Astronomical Society, 2021 – Present

American Physical Society, 2021 – Present

Association of Latino Professionals For America, 2021 – Present

National Italian American Foundation, 2024 – Present

National Society of Hispanic Physicists, 2021 – Present

Sigma Xi, 2022 – Present

Society for the Advancement of Chicanos and Native Americans in Science, 2023 – Present

Society of Hispanic Professional Engineers, 2021 – Present

Society of Physics Students, 2021 – Present

COMPUTER SKILLS

Programming: Python, MATLAB, R, Java, LaTeX, Unix shell

Applications: GitHub, Jupyter Notebook, JupyterLab, ArcGIS, Visual Studio Code, Google Docs Editors, Microsoft Office, MobaXterm, SigmaPlot, Zotero, Amazon AWS

EXTRACURRICULARS

Future GRADS MentorSHPE, 2023 – 2024
Mentoring program for prospective graduate students from underrepresented backgrounds emphasizing networking and writing graduate application essays. Hosted by the Society of Hispanic Professional Engineers.

SIMIODE Challenge Using Differential Equations Modeling VI, 2021
Modeled the spread and censorship of misinformation on social media platforms via differential equations with an epidemiological approach. Presentation won Meritorious Award.

Directed Reading Program, 2021

Learned topics in quantum field theory. Learned topics in differential geometry. Presented on both subject areas.

HackUTD: The VII Seas, 2021

Collaborated in a team of three to implement a quantum computer algorithm to classify solar flare data. Successfully implemented with an accuracy of 98% 24 hours in advance.

Cornell Society of Physics Students, 2020 – Present

Cornell Math Club, 2020 – 2021

Cornell Astronomical Society, 2020 – Present

Cornell Chess Club, 2020 – Present

Competed in the 2023 – 2024 United States Amateur East Championships. Captain of the Cornell C Team.

Cornell Mathematical Contest in Modeling, 2020

Helped develop an algorithm to optimize scheduling for the Food Bank of the Southern Tier.

Cornell Undergraduate Research Board, 2020

Mentoring program for undergraduate students planning research careers emphasizing professional development, presenting research, and interacting with professors.

LANGUAGES

English: Native Language

Italian: Intermediate in Listening, Speaking, Reading, and Writing

HOBBIES

Stargazing, playing classical music, reading science fiction and classical literature, fishing for small mouth bass