

Thara Caba

MSc. Student, Astrophysics & Space Science

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SUMMARY

I am an astrophysics master's student with a strong background in multi-messenger astrophysics, statistics, and computational techniques. I have hands-on experience analyzing data from major astrophysical experiments such as MAGIC and IceCube, with a focus on source detection.

RESEARCH EXPERIENCE

Research Assistant - Autonomous University of Santo Domingo (UASD) Sep 2019 - Present

Supported administrative and research activities for the Institute of Physics. Assisted in collaborative research, report writing, and organizing academic events. *Supervised by Dr. Nelphy de la Cruz, Statistical and Computational Physics Research Group Leader.*

Research Assistant - Max Planck Institute for Physics Jul 2024 - Sep 2024

Conducted analysis using Bayesian-based software to calculate the association probability between neutrino events and astrophysical sources. Worked with IceCube neutrino data, focusing on the TXS 0506+056 and IC170922A association under different spectral models (Power Law, $p\gamma$). *Supervised by Dr. Francesca Capel, Astrophysical Messengers Group Leader.*

Remote Fellow - Office of Astronomy for Development Jun 2023 - Oct 2023

Contributed to the [Astronomy for Mental Health](#) flagship project. Developed student engagement strategies and organized workshops to promote mental health through astronomy. *Supervised by MSW. Dominic Vertue.*

Research Assistant - University of Padova Feb 2022 - Feb 2023

Worked on bachelor's thesis in multi-messenger astrophysics, analyzing MAGIC telescope data. Derived very high-energy gamma-ray flux upper limits and created sky maps using SkyPrism software. *Supervised by Dr. Elisa Bernardini & Dr. Konstancja Satalecka.*

Research Assistant - University of Louisville Aug 2022 - Nov 2022

Participated in the [Central American - Caribbean \(CENCA\) Bridge in Astrophysics](#) research program. Conducted a study on spiral galaxies and how their environment affects the number of arms. *Supervised by Dr. Benne Holwerda.*

EDUCATION

Present **Master's Degree**, [Erasmus Mundus Joint Master Program in Astrophysics & Space Science](#)
University of Rome Tor Vergata & University of Belgrade

2023 **Bachelor's Degree** (cum laude), Physics
Autonomous University of Santo Domingo
Thesis: Deriving very high energy gamma-ray flux upper limits on sky maps using the SkyPrism software. Supervised by Dr. Elisa Bernardini & Dr. Konstancja Satalecka.

HONORS, AWARDS & GRANTS

Women and Girls in Astronomy Mini-Grant 2023 - Present

Granted by the North American Regional Office of Astronomy for Development (NA-ROAD) to organize the Month of Astronomy in the Dominican Republic.

Erasmus Mundus Joint Master Scholarship 2023 - Present

Awarded by Erasmus+ to support my master's degree in Astrophysics and Space Science.

Hanrieder Fellowship 2024

Granted by the Max Planck Institute for Physics and the Hanrieder Foundation to support my internship at the Max Planck Institute for Physics.

Italian Ministry of Foreign Affairs and International Cooperation Scholarship 2023 - 2024

Awarded by the Italian Ministry of Foreign Affairs to support my master's degree in Astrophysics and Space Science.

International Astronomy and Astrophysics Competition National Award 2023

Awarded for achieving the highest nationwide score in the final round of the International Astronomy and Astrophysics Competition 2023. [Verify-ID: FN-2023-F3E6271733C](#).

Idelisa Bonnelly Scholarship for Women in STEM 2021 - 2023

Awarded by the Ministry of Youth of the Dominican Republic to support the completion of my bachelor's in physics.

National Scholarship 2018 - 2021

Granted by the Ministry of Higher Education, Science, and Technology of the Dominican Republic to support my bachelor's in physics.

SELECTED POSTERS & TALKS

- Jan 2024 **Panel:** Astronomy for a Better World, *American Astronomical Society Winter Meeting*, United States.
- Jul 2023 **Poster:** The Multi-messenger Astrophysics Approach and the MAGIC Telescopes, *Giambigi Winter School on Cosmology*, Argentina.
- May 2023 **Poster:** Study of Spiral Galaxies and Their Environment, *PLANCKS*, Italy.
- Jan 2023 **Talk:** Study of Spiral Galaxies and Their Environment, *IV International Congress of the Dominican Physical Society*, Dominican Republic.
- Nov 2022 **Talk:** The Multi-messenger Astrophysics Approach and the MAGIC Telescopes, *VIII Student Congress of Physics and Mathematics*, Guatemala.
- Sep 2022 **Talk:** The Multi-messenger Astrophysics Approach and the MAGIC Telescopes, *VII Student Congress of Scientific Research and Technology*, Dominican Republic.
- Sep 2022 **Poster:** The Multi-messenger Astrophysics Approach and the MAGIC Telescopes, *International Conference of Physics Students*, Mexico.
- Mar 2019 **Panel:** Women in Science, Development and Innovation, *Autonomous University of Santo Domingo*, Dominican Republic.
- Oct 2019 **Panel:** Building on the Nexus of Science and Diplomacy to Promote Peace and Security, *Comprehensive Nuclear-Test-Ban Treaty Organization*, Dominican Republic.

TEACHING EXPERIENCE

Teaching Assistant

2021 - 2023

Modern Physics, 7th Semester, UASD. Assisted in lectures, graded assignments and exams, and provided academic support to students.

Teaching Assistant

2023

Basic Physics, 1st Semester, UASD. Assisted with student queries, and evaluated coursework.

VOLUNTEER & OUTREACH WORK

jIAPS Editor-in-Chief

2024 - Present

In charge of the 2025 issue of the journal for the [International Association of Physics Students \(IAPS\)](#), a non-profit organization run by physics students worldwide.

CENCA Bridge in Astrophysics Mentor

2023 - Present

Mentored two students during their first research experience: **Leiany De Oleo Rodríguez** (Investigating the Circumgalactic Medium) and **Daniela Azucena Cardona Cuc** (Binarity in young star clusters).

Month of Astronomy in the Dominican Republic

2023 - Present

Organized a month-long series of talks and activities introducing high school and university students to astronomy. Supported by NA-ROAD, Heising-Simons Foundation, and IAPS.

Social Media Manager

2023 - Present

Managed social media for the Dominican Physical Society, promoting events and scientific outreach.

Teaching Committee Student Representative of MASS

2023 - 2024

Represent students in the MASS Teaching Committee, contributing to decisions on academic program changes and course consistency.

Secretary

2022 - 2023

Managed administrative duties, including communications and organization of events, for IAPS.

Member of Affiliated Commission 5

2022 - 2023

Maintained relations between IAPS and the [International Union of Pure and Applied Physics](#), with a focus on communications.

PR Manager

2021 - 2022

Led the social media and public relations efforts for IAPS, promoting events and engaging with the global physics student community.

President of the Association of Physics Students UASD

2020 - 2021

Strengthened the student association's connection to IAPS, increasing opportunities for students. Managed administrative duties and facilitated communication between students and faculty.

CERTIFICATIONS

- 2024 [Observational Astronomy and Data Processing](#), **MASS Summer School 2024**
- 2024 [Python Essentials 2](#), **Cisco Networking Academy**
- 2024 [From Stars to Cosmic Explosions: Bridging Scales in Astrophysical Data Analysis](#), **MASS Winter School 2024**
- 2024 [Introduction to Quantum Computing](#), **The Coding School**
- 2023 [Giambiagi Winter School on Cosmology](#), **International Center for Theoretical Physics and University of Buenos Aires**
- 2023 [Designing Effective Science Communication](#), **University of Colorado Boulder**
- 2022 [Introduction to Data Science](#), **Cisco Networking Academy**
- 2022 [Python Essentials 1](#), **Cisco Networking Academy**
- 2022 [Gravitational Wave Open Data Workshop](#), **LIGO Scientific Collaboration and VIRGO Collaboration**
- 2021 [C for Everyone: Structured Programming](#), **University of California**

SKILLS

Programming	Python, C/C++, FORTRAN, SQL, Git, Bash.
Academic Tools	LaTeX, Microsoft Office.
Languages	Spanish (native), English (fluent).