

# ROSARIO CECILIO-FLORES-ELIE

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## RESEARCH INTERESTS

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Ocean worlds, Enceladus, Europa, Titan, planet-moon interaction, exoplanet detection and characterization, exoplanet atmospheres, habitability dynamics, field research, geophysics, cryosphere, and climate change

## EDUCATION

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### CORNELL UNIVERSITY

*Ph.D. in Geological Sciences*

Aug. 2024

Ithaca, NY

### THE GRADUATE CENTER CUNY

*MS in Astrophysics*

Sept. 2024

New York, NY

### LEHMAN COLLEGE CUNY

*BS in Physics, Dean's List*

Jan. 2022

Bronx, NY

### ALFRED UNIVERSITY

*MSEd in Literacy Education*

May 2015

Alfred, NY

### LEHMAN COLLEGE CUNY

*BA in Sociology, Minor: Childhood Bilingual Education, Dean's List*

May 2013

Bronx, NY

## RESEARCH EXPERIENCE

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### GRADUATE RESEARCH STUDENT - CORNELL UNIVERSITY - DEPT. OF EARTH & ATMOSPHERIC SCIENCES

Aug. 2024 – Present

*Advisor: Carolina Muñoz-Saez*

Ithaca, NY

- Utilizing geophysical sounding profiles on geysers in El Tatio, Chile, to track acoustic signals and analyze water behavior under varied environmental conditions to draw connections between Earth's geysers and those on icy moons such as Enceladus.

### GRADUATE RESEARCH FELLOW - AMERICAN MUSEUM OF NATURAL HISTORY -DEPT. OF ASTROPHYSICS

Aug. 2022 – Sept. 2024

*Advisor: Jacqueline Faherty*

New York, NY

- Examined the mass ratios, separation, and binding energies of planets and their moons in a comparative analysis with more massive celestial bodies that range from Stellar to planetary to identify correlations that can hint us of similarities of geological activity and potentially habitable worlds beyond the solar system.
- Analyzed 100 NASA's TESS mission light curves from young stars from the Carina-Near Moving Group utilizing a Lomb-Scargle periodogram to obtain the best-fit rotation period, detect stellar activities, solar flares, fast rotators, and signs of binarity.

### REU -WATER QUALITY IN THE YUCATAN PENINSULA -NORTHERN ILLINOIS UNIVERSITY

June 2021 – Aug. 2021

*Advisor: Philip J. Carpenter*

Dekalb, IL

- Conducted geophysical surveys in Riviera Maya, Mexico using SuperStingTM to locate subsurface karst conduits near cenotes, advancing regional karst hydrogeology knowledge with a focus on the Holbox Fracture Zone.
- Employed electrical resistivity methods to locate subsurface karst conduits near cenotes, revealing significant findings, including an air cavity under the field site, Agua Azul's soccer field, and a saturated karst conduit just 5 meters below the surface.

### NASA L'SPACE ACADEMY - MISSION CONCEPT ACADEMY (MCA)

Aug. 2020 – Dec. 2020

*Team 11 - Northern Lights: Scientific Research and Outreach - (Student Project)*

Online

- Collaborated with a team of eleven students, contributing to the Preliminary Design Review (PDR) of a secondary payload lander mission for Enceladus, with a specific focus on the Bagdad Sulcus in the South Pole-Tiger Stripe region.
- Conducted extensive research on advanced scientific instruments, including mass spectrometers and geophysical sonar technologies. Utilized Java Mission-planning and Analysis for Remote Sensing (JMARS) to pinpoint suitable landing sites.
- Spearheaded an educational outreach STEM initiative to serve 45 low-income public schools in New York City.

## NASA L'SPACE ACADEMY - PROPOSAL WRITING AND EVALUATION EXPERIENCE (NPWEE)

May. 2020 – Aug. 2020

Team 7 - UV Voyagers: Investigating Water Quality Metrics - (Student Project)

Online

- Collaborated with a team of seven students to develop water quality metrics for a prototype with UV disinfection, enhancing water systems for the International Space Station (ISS) and future spacecraft.
- Researched and ensured cost-effective, technically feasible solutions for water quality metrics and UV disinfection, aligning with NASA's objectives within a \$ 10,000 seed funding budget.

## TEACHING EXPERIENCE

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### SECOND GRADE - DUAL LANGUAGE TEACHER

Aug. 2013 – Sept. 2022

PS/IS 218 Rafael Hernandez Dual Language Magnet School

Bronx, NY

- Implemented dual language methodologies and pedagogy to deliver engaging and effective instruction to 25-50 second-grade students, fostering high levels of achievement through a side-by-side model in English and Spanish.
- Developed educational materials and scaffolding strategies to support diverse learners, including students with disabilities and multilingual learners.

### SECOND GRADE TEAM - CURRICULUM LEAD

Aug. 2014 – Sept. 2022

PS/IS 218 Rafael Hernandez Dual Language Magnet School

Bronx, NY

- Crafted customized literacy units catered to the distinct experiences and learning needs of second-grade students, meticulously aligning content with both state and federal educational standards.

### STUDENT TEACHER MENTOR

Sept. 2015 – Dec. 2021

PS/IS 218 Rafael Hernandez Dual Language Magnet School

Bronx, NY

- Provided mentorship to 1-2 student-teachers annually, sharing my expertise and pedagogical knowledge to support their professional growth and development.
- Engaged in monthly teacher leader/mentor meetings, gaining insights from the US PREP Program and Lehman College CUNY to enhance support strategies for student-teachers.

## FELLOWSHIPS AND AWARDS

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### LONG FELLOWSHIP (DEPARTMENT OF EARTH AND ATMOSPHERIC SCIENCES)

Aug. 2024

Cornell University

### PUBLIC FACING TRANSLATION CUNY SciCOM - BEST POSTER

June 2023

CUNY Science Communication Symposium

### STUDENT TRAVEL GRANT

Dec. 2021

American Geophysical Union (AGU)

## PUBLICATIONS

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### Other co-authors:

1. Rothermich, A., et al. (incl **Cecilio-Flores-Elic, R.**) 2024. "89 New Ultracool Dwarf Co-Moving Companions Identified With The Backyard Worlds: Planet 9 Citizen Science Project". *The Astronomical Journal*

## CONFERENCES AND SYMPOSIUMS

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### "EXPLORING MASS RATIOS IN PLANETARY-MOON SYSTEMS: INSIGHTS FROM OUR SOLAR SYSTEM AND BEYOND"

Jan. 2024

Poster Presenter - American Astronomical Society (AAS)

New Orleans, LA

### "MASS RATIOS OF PLANETS AND ACTIVE MOONS: INSIGHTS FOR OCEAN WORLD OBSERVATION"

Dec. 2023

Poster Presenter - American Geophysical Union (AGU)

San Francisco, CA

### PUBLIC FACING TRANSLATION - "OCEAN WORLDS: TO ENCELADUS AND BEYOND"

June 2023

Poster Presenter - CUNY Science Communication Symposium

New York, NY

## "KARST CONDUIT IDENTIFICATION USING GEOPHYSICAL SURVEYS IN NORTHERN YUCATÁN, MÉXICO"

Poster Presenter - NDISTEM SACNAS Conference

Oct. 2022

San Juan, PR

## "KARST CONDUIT IDENTIFICATION USING GEOPHYSICAL SURVEYS IN NORTHERN YUCATÁN, MÉXICO"

Oral Presenter - American Geophysical Union (AGU)

Dec. 2021

New Orleans, LA

### OUTREACH AND TALKS

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#### OPEN SPACE - PLANETARIUM SHOW (CO-RAN)

Hunter High School Field Trip - American Museum of Natural History

May 2024

New York, NY

#### FROM STARS TO MOONS: CELESTIAL INTERACTIONS - TALK

Lang Science Program - American Museum of Natural History

Feb. 2024

New York, NY

#### "DECODING THE NIGHT SKY - EXPLORING MAYA ASTRONOMY"

Science StoryTellers - Variety Boys and Girls Club of Queens

April 2023

Queens, NY

### SCIENCE COMMUNICATION

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#### APRENDIZAJE AUTOMATICO PARA FISICA Y ASTRONOMIA - COURSE

Astromaquinaros-Spanish Translator

April 2023 – Sept. 2024

New York, NY

- Collaborated with a team of astronomers to translate Dr. Viviana Acquaviva's *Machine Learning for Physics and Astronomy* online course from English to Spanish through the translation of PowerPoint lessons, Jupyter Notebook exercises, and quizzes, facilitating comprehensive engagement for Spanish-speaking students through **Open Learning - Flatiron Institute**.

### WORKSHOPS AND TRAINING

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#### ASTROTECH - ASTRONOMICAL INSTRUMENTATION SUMMER SCHOOL

UC Berkeley

July 2023

Berkeley, CA

- Engaged in a hands-on five-day workshop focused on crafting astronomical instruments. Learned optomechanics, optics, and instrumentation techniques under expert guidance.
- Collaborated within interdisciplinary teams, actively participating in an optics laboratory setting while honing expertise in optomechanical aspects of instrument development, contributing to the successful construction and testing of an astronomical spectrograph.

#### NEXSCI - SAGAN EXOPLANET SUMMER WORKSHOP

California Institute of Technology

July 2023

Pasadena, CA

- Engaged in an immersive learning experience focused on the latest advancements in exoplanet atmosphere observations, theoretical modeling, and interpretation, led by prominent experts in the field.
- Participated in interactive sessions analyzing data from the James Webb Telescope and exoplanet atmospheres, advancing comprehension of formation, composition, and dynamic processes.

### SKILLS

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**Programming** Python (Intermediate), Machine Learning (Intermediate), Java Mission-planning and Analysis for Remote Sensing (JMARS) (Beginner)

**Editing Software** Overleaf LaTeX editor (Intermediate)

**Instrumentation** Supersting Geophysical Instrument (Intermediate)

**Languages** Bilingual and bi-literate in English and Spanish

**Certifications** NYS Childhood Education (grade 1-6); Bilingual Extension (grade Pre-k-12)

**Other** American Red Cross First Aid/CPR/AED

## PROFESSIONAL SOCIETY MEMBERSHIPS

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American Geophysical Union (**AGU**)

American Astronomical Society (**AAS**)

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (**SACNAS**)

The League of Underrepresented Minoritized Astronomers (**LUMA**)

GeoLatinas