

# 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, cryosphere, and climate change

## EDUCATION

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### THE GRADUATE CENTER CUNY

MS - Astrophysics

Aug. 2023 - Present

New York, NY

### LEHMAN COLLEGE CUNY

BS - Physics

2017 - 2022

Bronx, NY

### ALFRED UNIVERSITY

MSEd - Literacy Education

2014 - 2015

Alfred, NY

### LEHMAN COLLEGE CUNY

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

2008 - 2013

Bronx, NY

## RESEARCH EXPERIENCE

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### GRADUATE RESEARCH FELLOW - AMNH DEPT. OF ASTROPHYSICS; BDNYC

Advisor: Dr. Jacqueline Faherty

Aug. 2022 - Present

New York, NY

- Analyze NASA's TESS mission light curves from young co-moving stars to ascertain their rotational periods and detect stellar activities, including solar flares, fast rotators, and signs of binarity.
- Utilize Python for data visualization to map the mass ratio of gas giants and their moons, exploring dynamics and reciprocal influence between gas giants and associated moons, with a focus on active moons like Enceladus.
- Employ user-friendly tools such as "lightkurve" to master the methodologies for identifying transiting planets around remote stars.

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

Advisor: Dr. Philip J. Carpenter

June 2021 - August 2021

DeKalb, IL

- Conducted geophysical surveys in the Riviera Maya, Mexico, using The SuperSting™ instrument to identify subsurface karst conduits near cenotes or sinkholes, deepening our understanding of karst hydrogeology in the region, particularly along the Holbox Fracture Zone.
- Utilized 2D-electrical and azimuthal resistivity methods near Cenote Verde Lucero and Agua Azul sites to detect air and water-filled conduits, fracture zones, and their orientations, revealing insights into water flow direction and karst dynamics. Notable findings include an air cavity of 3 meters depth beneath Agua Azul's soccer field and a saturated karst conduit just 5 meters below.
- Applied the spontaneous potential (SP) method to identify fractures with water seepage in the vadose zone, resulting in significant discoveries such as new conduits or openings at the Well-Field site.
- Analyzed water conductivity results from cenote water samples provided by the chemistry team, applying Archie's law to determine rock resistivity at 224 ohm-meters, corroborating findings from azimuthal resistivity surveys.

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

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

Aug. 2020 - Dec. 2020

Online

- Collaborated with a team of eleven students to develop a Preliminary Design Review (PDR) for a proposed second payload lander mission studying Enceladus' South Pole-Tiger Stripe region. Aimed to analyze organic and inorganic particles in the Baghdad sulcus and understand the moon's geological context and subsurface ocean dynamics.
- Carried out research encompassing landing site selection, scientific instrument evaluation, and lunar atmospheric conditions.
- Co-led the educational outreach initiative involving allocating funds for a STEM program benefiting forty-five low-income public schools across New York City's five boroughs.

- Gained valuable mission development skills through regular training sessions with NASA experts, acquiring expertise in mission planning, risk assessment, and project management.

#### **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 pump-driven re-circulation lines prototype, incorporating ultraviolet (UV) disinfection to prevent microbial bio-film growth in water systems for the International Space Station (ISS) and future crewed spacecraft.
- Conducted thorough research on water quality metrics and UV disinfection techniques to ensure the proposed solution met technical feasibility and cost-effectiveness and aligned with NASA's mission objectives within a budget.
- Acquired valuable proposal writing and evaluation skills, including developing solid technical writing abilities and effective teamwork with subject matter experts to deliver a high-quality proposal.

#### **TEACHING EXPERIENCE**

##### **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 instruction to 25-50 second-grade students, ensuring high levels of achievement through a side-by-side model in English and Spanish.
- Organized annual field trips to museums in New York City, such as the American Museum of Natural History, facilitating student engagement and learning, mainly through visits to notable exhibits like the Planetarium.

##### **SECOND GRADE TEAM - CURRICULUM LEAD**

Aug. 2014 – Sept. 2022

*PS/IS 218 Rafael Hernandez Dual Language Magnet School*

*Bronx, NY*

- Spearheaded the design and implementation of culturally responsive literacy units for second grade, amplifying students' urban upbringing within New York City and seamlessly weaving in Social Studies and Science elements.
- Developed targeted educational materials, including customized graphic organizers and literacy-focused bookmarks, designed to cater to diverse learners, including students with disabilities and English language learners, and employed scaffolding strategies to optimize their learning journey.

##### **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.

#### **SCIENCE COMMUNICATION**

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

April 2023 – Present

*Astromaquinaros-Spanish Translator*

*New York, NY*

- Collaborate within a team of four to translate Dr. Viviana Acquaviva's "Machine Learning for Physics and Astronomy" online course from English to Spanish, ensuring the precise translation of PowerPoint lessons, Jupyter notebook exercises, and quizzes involving machine learning terminology. This enables Spanish-speaking students to engage with the course materials comprehensively.
- Record concise and informative 10-15 minute lessons in Spanish, offering explanations of methods and guidance through Jupyter notebook exercises to enhance the learning experience.

#### **SKILLS**

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

**Editing Software** Overleaf LaTeX editor

**Instrumentation** Supersting Geophysical Instrument

**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

## 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.

## SCHOLARLY ACTIVITIES

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### **"OCEAN WORLDS: TO ENCELADUS AND BEYOND"**

*Poster - CUNY Science Communication Symposium*

June 2023

*New York, NY*

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

*Poster - NDISTEM SACNAS Conference*

October 2022

*San Juan, PR*

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

*Oral Presenter - AGU Conference*

December 2021

*New Orleans, LA*

## FELLOWSHIPS AND AWARDS

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### **PUBLIC FACING TRANSLATION CUNY SciCOM - BEST POSTER**

*CUNY Science Communication Symposium*

June 2023

### **AGU STUDENT TRAVEL GRANT**

December 2021

## OUTREACH

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### **PUBLIC FACING TRANSLATION - POSTER PRESENTER**

*CUNY Science Communication Symposium*

June 2023

*New York, NY*

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

*Science StoryTellers - Variety Boys and Girls Club of Queens*

April 2023

*Queens, NY*

## PROFESSIONAL SOCIETY MEMBERSHIPS

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American Astronomical Society (AAS)

American Geophysical Union (AGU)

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

GeoLatinas