Rosario Cecilio-Flores-Elie

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Research Interests

Ocean worlds, Galilean moons, Enceladus, Titan, gas giants, brown dwarf, planet-moon interaction, exoplanet detection and characterization, exoplanet atmospheres, dynamic habitability, field research, cryosphere, and climate change

Education

The Graduate Center CUNY Aug. 2023 - Present
MS - Astrophysics *New York, NY*

Lehman College CUNY 2017 - 2022
BS - Physics, Dean's List *Bronx, NY*

Alfred University 2014 - 2015
MSEd - Literacy Education *Alfred, NY*

Lehman College CUNY 2008 - 2013
BA - Sociology, Minor: Childhood Bilingual Education, Dean's List *Bronx, NY*

Research Experience

Graduate Research Fellow - American Museum of Natural History -Dept. of Astrophysics Aug. 2022 – Present
Advisor: Dr. Jacqueline Faherty *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 Penisula -Northern Illinois University June 2021 – August 2021
Advisor: Dr. 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

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 educational 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*

- 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.
- 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.

Outreach

Public Facing Translation - Poster Presenter June 2023
CUNY Science Communication Symposium *New York, NY*

"Decoding the Night Sky - Exploring Maya Astronomy" April 2023
Science StoryTellers - Variety Boys and Girls Club of Queens *Queens, NY*

Science Communication

Aprendizaje Automatico para Fisica y Astronomia - Course April 2023 – Present
Astromaquinarios-Spanish Translator *New York, NY*

- Collaborate with a team of four to accurately translate Dr. Viviana Acquaviva's "Machine Learning for Physics and Astronomy" online course from English to Spanish. Ensure precise translation of PowerPoint lessons, Jupyter notebook exercises, and quizzes, facilitating comprehensive engagement for Spanish-speaking students through Open Learning at Flatiron Institute.
- Create informative 10-15 minute instructional videos in Spanish, providing clear explanations of methods and guiding through Jupyter notebook exercises to enhance the learning process.

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

Publications

Other co-authors:

1. Rothermich, A., Faherty, J., Bardalez-Gagliuffi, D., et al. (incl **Cecilio-Flores-Elie, R.**) 2023 (*in review*). *Identification of New Brown Dwarf Co-Moving Companions*.

Conferences and Symposiums

"Exploring Mass Ratios in Planetary-Moon Systems: Insights from Our Solar System and Beyond" January 2024
Poster Presenter - American Astronomical Society (AAS) *New Orleans, LA*

"Mass Ratios of Planets and Active Moons: Insights for Ocean World Observation" December 2023
Poster Presenter - American Geophysical Union (AGU) *San Francisco, CA*

"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" October 2022
Poster Presenter - NDISTEM SACNAS Conference *San Juan, PR*

"Karst Conduit Identification Using Geophysical Surveys in Northern Yucatán, México" December 2021
Oral Presenter - American Geophysical Union (AGU) *New Orleans, LA*

Workshops and Training

AstroTech - Astronomical Instrumentation Summer School July 2023
UC Berkeley *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 July 2023
California Institute of Technology *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.

Fellowhips and Awards

Public Facing Translation CUNY SciCom - Best Poster June 2023
CUNY Science Communication Symposium

AGU Student Travel Grant December 2021

Professional Society Memberships

American Astronomical Society (AAS)
American Geophysical Union (AGU)
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
GeoLatinas