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CONTACT INFORMATION Department of Physics, UPR Río Piedras 17 Ave. Universidad Ste. 1701

San Juan, PR 00925-2537

**EDUCATION** 

### Bachelor of Science in Physics with a second concentration in Philosophy

In Progress

University of Puerto Rico Río Piedras Campus, San Juan, Puerto Rico

• Visiting student at Brown University for the academic year of 2017-2018

# **High School Diploma** (with High Honors)

2016

Escuela Secundaria de la Universidad de Puerto Rico (UHS), San Juan, Puerto Rico

ADDITIONAL EDUCATION

#### **NASA L'SPACE Virtual Academies**

Spring, Fall 2019

Mission Concept Academy and NASA Proposal Writing and Evaluation Experience

RESEARCH POSITIONS

# **Astrophysics Undergraduate Researcher**

Jun 2019 to present

Banneker Institute, Center for Astrophysics | Harvard & Smithsonian

• Programming dynamical simulations of exoplanetary systems using Python and RE-BOUND, and analyzing *Kepler* light curves for grazing transits and transit timing variations. Working on identifying origin of transit timing variations from simulation results.

# Fellow in Philosophy and Theory of Astrophysics

May 2019 to present

Mellon-Mays Undergraduate Fellowship, University of Puerto Rico Río Piedras Campus

• Exploring data-generation in interferometry through epistemological analysis, constructing a corresponding data model, and studying astronomical image-making to inform how we communicate its results.

#### Researcher in Radio Astronomy

May 2018 to present

Planetary Habitability Laboratory, University of Puerto Rico at Arecibo

• In charge of preparing & submitting observing proposals, running observations, reducing and analyzing data (IDL & Python), and working with the educational component of incorporating students into observations and communicating the PHL's research.

MISSION
DEVELOPMENT
EXPERIENCE

### **Team Mechanical Engineer & Scientist**

Aug 2019 to present

RockSat-X Project, University of Puerto Rico Río Piedras Campus

• Working on the Astrogenomics Sequencing at the Karman Line (ASK-L) sounding rocket experiment, from initial design to eventual launch.

### **Team Scientist & Operations Officer**

Jan 2019 to May 2019

L'SPACE Undergraduate Mission Concept Academy, NASA

• Worked on a Preliminary Design Review for the Spectral Electromagnetic Exploration Rover. Conducted research & designed the mission experiment & data acquisition.

AREAS OF SPECIALIZATION

*Planetary, Exoplanetary, and Observational Astrophysics*, with a particular focus on radio astronomical studies of solar system bodies and exoplanetary systems; potential radio detections of exoplanets; observational astrobiology and exoplanet characterization; radio interferometry; and multiwavelength observational astrophysics.

Philosophy and Theory of Science and Astrophysics, with a particular focus on the epistemology of data generation in observational astrophysics; models of data in radio and optical interferometric methods; image-making in astronomy; as well as an interest for the ethics of astronomy and land.

Sep 2018 to Apr 2019

AWARDED

**Submillimeter Array** Interferometry School Program (2020):

TELESCOPE TIME Observing 3C 346 with the Submillimeter Array

Special Program, 2020 School. Principal Investigator: K. Ortiz Ceballos. Allocated 3 hours.

**Arecibo Observatory** Director's Discretionary Time Urgent Proposal (2019): *Observing the 18 cm OH radical line in interstellar comet C/2019 Q4 (Borisov)* Project A3390. **Principal Investigator: K. Ortiz Ceballos. Allocated 12 hours.** 

Arecibo Observatory Spring Semester (2019, as Co-Investigator):

Radio Emissions from Dwarf Stars with Planets IV

Project A3123. Principal Investigator: A. Méndez. Allocated 24 hours.

### RESEARCH AWARDS

## **USRA Distinguished Undergraduate Scholarship** | \$5k

# Mellon-Mays Undergraduate Fellowship | \$36k

Awarded to fund philosophy and theory of astrophysics work at the Department of Philosophy. Hosted at the University of Puerto Rico, Río Piedras Campus, 2019-2021.

### Louis Stokes Alliance for Minority Participation Award | \$2.5k

Awarded to fund radio astronomy work at the Planetary Habitability Laboratory.

Hosted at the University of Puerto Rico at Arecibo, 2019-2020.

#### Puerto Rico Space Grant Consortium NASA Fellowship | \$10k

Awarded to fund radio astronomy work at the Planetary Habitability Laboratory.

Hosted at the University of Puerto Rico at Arecibo, 2018-2019.

#### OTHER AWARDS

First Billion Years: Habitability Conference Travel Award | \$2.5k, funded by USRA

50th Lunar and Planetary Science Conference Travel Award | \$2.5k, funded by PRSGC

United Nations Academic Impact Millennium Fellowship

Honor Studies Program, University of Puerto Rico Río Piedras Campus

Dean's List, University of Puerto Rico Río Piedras Campus

# TECHNICAL SKILLS

**Astronomy:** Radio telescope operation and observation planning, on-site and remotely; astronomical spectroscopy and general radio astronomical data reduction.

**Programming & Analysis:** Python, IDL, shell scripting. DS9, Astropy.

UPRRP Rep. to the National Student Confederation of Puerto Rico

Other Software: Autodesk Inventor, JMARS, LATEX, Adobe Photoshop, Premiere & Lightroom

OS: macOS, Unix, Linux, Windows

### UNIVERSITY SERVICE

| Alt. Representative to the Board of Graduate Studies and Research | Sep 2019 to present  |
|---|----------------------|
| Academic Senator for the Faculty of Natural Sciences, UPRRP       | Sep 2018 to Sep 2019 |
| Spokesperson for the Senate Student Caucus                        | Apr 2019 to Sep 2019 |
| Representative, Natural Sciences Student Council, UPRRP           | Sep 2018 to Sep 2019 |
| President, Academic Issues and Orientation Committee              |                      |
| Member, Law and Regulation Committee                              |                      |
| Representative, General Student Council, UPRRP                    | Sep 2018 to Sep 2019 |
| Member, Gender & Equity Issues Committee                          |                      |

SCIENCE POLICY
OUTREACH

#### Science Policy Ambassador for the Puerto Rico Science Policy Action Network (PR-SPAN)

As Ambassador of PR-SPAN, in charge of informing the development and implementation
of federal, state and local policies based on scientific evidence. Specific tasks include editing of PR-SPAN newsletter and materials, assistance in event organizing, and advocating
directly to federal and state legislatures and policymakers.

# EDUCATION & PUBLIC OUTREACH

- Vicepresident of the Circle of University Astrobiology, UPRRP. Fall 2019.
- Helped bring over 40 students and community members to take part in on-site observations at the Arecibo Observatory. 2019.
- Algebra tutor for 9th graders at Hope High School in Providence, RI as part of the STEMS Program at Brown University. Spring 2018.
- Co-founded and co-directed Multi-faith Organizing for College Hill Activism (MOCHA) at Brown University. Spring 2018.
- Calculus I, II & III voluntary tutor at the Faculty of Natural Sciences, UPRRP. 2017.

# TALKS & PRESENTATIONS

• "What's In a Picture of a Shadow? Looking at a Black Hole"

Oral Presentation. MMUF Southeastern Regional Conference. Houston, Texas, 2019

• "What's In a Picture of a Shadow? Looking at a Black Hole"

Oral Presentation. 12th Knowledge Cities World Summit. Florianópolis, Brasil, 2019

- "Arecibo REDS: The Stellar Activity of Stars with Potentially Habitable Planets" Poster. FBY: Habitability Conference. Big Sky, Montana, 2019
- "Trojan Asteroids Near the Orbit of Jupiter"

Invited Outreach Talk. Puerto Rico Astronomy Society. San Juan, Puerto Rico, 2019

• "Arecibo Radio Emissions from Dwarf Stars with Potentially Habitable Planets"

Oral Presentation. 53rd JTM / 38th PRISM Meeting, Mayagüez, Puerto Rico, 2019

• "Arecibo REDS: The Stellar Activity of Stars with Potentially Habitable Planets"

Poster. 50th Lunar and Planetary Science Conference, The Woodlands, Texas, 2019

• "Arecibo REDS: Radio Emissions from Red Dwarf Stars with Planets"

Oral Presentation. XVII Physics & Chemistry Forum, UPR Arecibo, Puerto Rico, 2018

• "String Theory: Towards a New Paradigm Beyond Falsifiability?"

Oral Presentation. 1st Philosophy Symposium, PCUPR, Ponce, Puerto Rico, 2018

# PROFESSIONAL MEMBERSHIPS

American Astronomical Society | Undergraduate Member Puerto Rico Astronomy Society | Student Member Society of Physics Students | National Member UPRRP Philosophy Students Association

# BIOGRAPHICAL INFORMATION

Citizenship: United States of America

Languages: Fluent in English and Spanish. Experienced as Spanish-English interpreter.