Kevin N. Ortiz Ceballos *(He/Him/Él)* — *Curriculum Vitae*

CONTACT INFORMATION

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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
- Thesis: *Potentially Detectable Radio Emissions from Exoplanetary Systems: A Review.*

High School Diploma (with High Honors) 2016
Escuela Secundaria de la Universidad de Puerto Rico (UHS), San Juan, Puerto Rico

RESEARCH POSITIONS

Astronomy Researcher May 2018 to *present*
Planetary Habitability Laboratory, University of Puerto Rico at Arecibo
- In charge of preparing observing proposals, running observations, analyzing data (IDL & Python), incorporating students into observations and communicating PHL research.
- Leading the project investigating OH emission in interstellar comet 2I/Borisov with the Arecibo Observatory. Collaborating in Arecibo REDS, a campaign studying radio flares from stars with habitable planets. Also contributing to theory projects studying objects in open orbits and habitability models.

Fellow in Philosophy of Science and Astrophysics Jun 2019 to *present*
Mellon-Mays Undergraduate Fellowship, University of Puerto Rico Río Piedras Campus
- Exploring data-generation in interferometry with epistemological analysis, constructing its data model, and studying astronomical image-making and its communication.

Astronomy Research Intern Jun 2020 to Jul 2020
Space Telescope Science Institute
- Worked with Hubble Space Telescope and TESS data to develop pixel-level decorrelation techniques for improving detections of exoplanet atmospheres using Python.

Astrophysics Undergraduate Researcher Jun 2019 to Aug 2019
Banneker Institute, Center for Astrophysics | Harvard & Smithsonian
- Programmed dynamical simulations of exoplanetary systems using Python and REBOUND. Identified origin of transit timing variations from simulation results.

MISSION DEVELOPMENT EXPERIENCE

Student Computer Engineer & Team Scientist Aug 2019 to May 2020
RockSat-X Project, University of Puerto Rico Río Piedras Campus
- Worked on the Astrogenomics Sequencing at the Karman Line (ASK-L) sounding rocket experiment, from initial design to construction of final payload. Helped program computer and telemetry systems with team, and assisted in preparing the payload.

Team Scientist & Operations Officer Jan 2019 to May 2019
L'SPACE Undergraduate Mission Concept Academy, NASA
- Worked on a Preliminary Design Review for the student-led Spectral Electromagnetic Exploration Rover (SEER) Mission Concept. Conducted research and designed the mission experiment and data acquisition.

AREAS OF INTEREST

Planetary, Exoplanetary, and Observational Astrophysics. Exoplanet characterization and transmission spectroscopy, radio astronomical and multiwavelength studies of solar system bodies and exoplanetary systems; observational astrobiology and exoplanet studies; potential radio detections of exoplanets; and multiwavelength observational astrophysics.

AWARDED TELESCOPE TIME

*As **Principal Investigator**:*

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

*As **Co-Investigator**:*

Arecibo Observatory:
Radio Emissions from Dwarf Stars with Planets IV, V & VI
Project A3123. **P.I.: A. Méndez. Allocated 68.75 hours over three semester proposals.**

***Special Program**:*

Submillimeter Array 2020 Interferometry School Program:
Observing 3C 346 with the Submillimeter Array
2020 SMA School. **Accepted for special program; 1.5 hours for group observation.**

TELESCOPE EXPERIENCE

Hubble Space Telescope
Experience with data reduction and analysis of exoplanet transit observations using open-source and custom code. Worked with WFC3 and STIS data.
Transiting Exoplanet Survey Satellite (TESS)
Experience with data reduction and analysis of exoplanet transits from raw datasets.
Submillimeter Array
Substantial experience scripting observations, calibrating with MIR and imaging with CASA.
Arecibo Observatory
Extensive experience successfully proposing and planning for focused and large programs. Skilled in remote and on-site telescope operation, data reduction, analysis and visualization.

TECHNICAL SKILLS

Programming & Analysis: Skilled with analysis software such as DS9, Astropy, NumPy, SciPy, MIR, CASA, and Arecibo Mock Spectrometer software. Experience using Python for transiting exoplanet analysis, astronomical spectroscopy, and dynamical simulations.

- **Python:** Intermediate, advanced for astronomy applications.
- **IDL:** Beginner to intermediate

Other Software Programs & Skills: Autodesk Inventor, JMARS, LaTeX, Adobe Photoshop, Premiere & Lightroom. macOS, Unix, Linux, Windows.

PROFESSIONAL DEVELOPMENT

Submillimeter Array 2020 Interferometry School Jan 2020
Submillimeter Array, Smithsonian Astrophysical Observatory

- Learned how to plan and write observing scripts for the Submillimeter Array, calibrated and reduced interferometric data with IDL, and imaged and analyzed results using CASA.

NASA Proposal Writing and Evaluation Experience Aug 2019 to Dec 2019
Lucy Student Pipeline Accelerator and Competency Enabler (L'SPACE), NASA

- Gained experience in the process of writing, reviewing, and scoring NASA proposals, participated in a proposal team and a proposal review board subject to NASA protocols.

SCIENCE POLICY LEADERSHIP & OUTREACH

Science Policy Ambassador Feb 2019 to *Present*
Puerto Rico Science Policy Action Network (PR-SPAN)

- In charge of informing the development and implementation of government policies based on scientific evidence. Advocating directly to federal and state legislators and policymakers.

AAS Congressional Visit Day Volunteer 2020 Sep 2020
American Astronomical Society

- Selected to advocate directly to Congress in D.C. on behalf of the AAS for federal support for astronomy. Trip cancelled, participated in virtual training instead due to COVID-19.

Research Awards

Barry Goldwater Scholarship
Awarded for the academic year 2020-2021.

USRA Distinguished Undergraduate Scholarship
1 of 4 such awards given in 2019 by the Universites Space Research Association (USRA).

Mellon-Mays Undergraduate Fellowship
Awarded for philosophy of astrophysics work at UPRRP. 2019-2021.

Puerto Rico Louis Stokes Alliance for Minority Participation (PR-LSAMP) Award
Awarded for radio astronomy work at UPR Arecibo. 2019-2021.

Puerto Rico Space Grant Consortium NASA Fellowship
Awarded for radio astronomy work at UPR Arecibo. 2018-2019.

Other Awards

Dean's List, UPRRP
Honor Studies Program, UPRRP
UPR Endowment Research Award
Nominated to Sigma Xi Membership
Santander-MIT Digital Transformation Award
Rafael Carrión Jr. Academic Excellence Award

Travel Awards

First Billion Years: Habitability Conference Travel Award
50th Lunar and Planetary Science Conference Travel Award (funded by PRSGC)
SACNAS 2020 Registration Scholarship (formerly Travel, made virtual due to COVID-19)

Education, Outreach & Service

Save the Arecibo Observatory, Volunteer — 2020 to *present*
Working with over 160 students in Puerto Rico to organize for rebuilding the Arecibo Observatory after its catastrophic collapse. Advocating to policymakers for the value of a new radar and telescope at Arecibo.

Circle of University Astrobiology - UPR Río Piedras, Vice President — 2019 to *present*
Organization for students interested in astrobiology. As Vice President, have helped organize events and a historical restoration project with Puerto Rico's first observatory.

- **Media Appearance:** "Long-lost astronomy observatory in Puerto Rico rediscovered by university students", article by Doris Elin Urrutia for Space.com.

PHL Outreach Program, Observer and Presenter — 2018 to *present*
Have helped bring over 50 students and community members to take part in on-site observations at the Arecibo Observatory, as well as take part in the Laboratory's outreach efforts through social and traditional media.

- **Media Appearance:** "Ciencia y Meteorología: Reconocen a jóvenes por sus investigaciones", outreach interview for Noticentro morning news segment in December 2019.

Swearer Tutoring Enrichment in Math and Science (STEMS) Program, Tutor — 2018
Algebra tutor for 9th graders as part of the STEMS Program at Brown University.

Volunteer Calculus I, II & III Tutor at UPRRP — 2017

Leadership & University Service

Academic Senator for the Faculty of Natural Sciences — Sep 2018 to Sep 2019
Sole student representative for the Faculty of Natural Sciences at the Academic Senate. Worked with faculty and administration officials to set curriculum and academic regulations of the University. *Committees: Law & University Regulations, Dean Selection Committee.*

Spokesperson for the Senate Student Caucus — Apr 2019 to Sep 2019
Natural Sciences Student Council Representative — Sep 2018 to Sep 2019
General Student Council Representative — Sep 2018 to Sep 2019
Representative, National Student Confederation of Puerto Rico — Sep 2018 to Apr 2019

INVITED TALKS

Observing the First Interstellar Comet 2I/Borisov from the Arecibo Observatory
- Seminar Series, Arecibo Observatory. Arecibo, Puerto Rico. Feb 19th, 2020.

Mapping the Habitable Universe from Puerto Rico
- Planetary Sciences Seminar Series, UCF. Orlando, Florida. Feb 7th, 2020

CONFERENCE ABSTRACTS

Oral session indicated by **. Long-form abstract indicated by* †*, PDF accessible with link.*

[7] 2020. **Ortiz Ceballos, K.N.**, Espinoza, N., Improving The Precision Of Exoplanet Atmospheric Detections Through Pixel-Level Decorrelation (PLD). SACNAS 2020, #67530.

[6] 2020. **Ortiz Ceballos, K.N.**†, Howell, E.S., Méndez, A., et al., Observing Interstellar Comet 2I/Borisov for Radio OH Lines with the Arecibo Observatory. LPSC LI, #3078.

[5] 2020. **Ortiz Ceballos, K.N.***, Pérez, J., Rediscovering the First Astronomical Observatory of Puerto Rico. AAS 235, Abs. #139.05.

[4] 2020. **Ortiz Ceballos, K.N.**, Quinn, S., Hadden, S., Yahalomi, D., Montet, B., N-body simulations of a warm Jupiter near resonance with a sub-Neptune. AAS 235, Abs. #174.26.

[3] 2020. Yahalomi, D.A., et al. including **Ortiz Ceballos, K.N.**, Discovery of a Warm Jupiter near Resonance with an Exterior sub-Neptune. AAS 235, Abs. #174.23.

[2] 2019. **Ortiz Ceballos, K.N.**†, Méndez, A., Zuluaga, J., et al., Arecibo REDS: The Stellar Activity of Stars with Potentially Habitable Planets. First Billion Years: Hab., #1038.

[1] 2019. **Ortiz Ceballos, K.N.**†, Méndez, A., Zuluaga, J., et al., Arecibo REDS: The Stellar Activity of Stars with Potentially Habitable Planets. LPSC L, #3161.

MANUSCRIPTS & PUBLICATIONS

Astrophysics: *One manuscript in preparation, a submitted paper and a Decadal white paper.*

[3] 2020. **Ortiz Ceballos, K.N.**, Howell, E.S., Méndez, A., et al., Radio OH Observations of Interstellar Comet 2I/Borisov. In preparation for a focus issue of *PSJ*.

[2] 2020. Méndez et al. incl. **Ortiz Ceballos, K.N.**, Habitability Models for Astrobiology. Accepted to *Astrobiology*.

[1] 2020. Méndez et al. incl. **Ortiz Ceballos, K.N.**, Habitability Models for Planetary Sciences. White Paper for the Planetary Science Decadal Survey 2023-2033. arXiv:2007.05491.

Philosophy: *One paper accepted for publication to the UPR journal [IN]Genios, peer-reviewed.*

[1] 2020. **Ortiz Ceballos, K.N.**, What's in an Image of a Shadow? The Image of M87* and the Philosophy of Shadows. Accepted for publication for Volume 7 of [IN]Genios.

SELECTED PROFESSIONAL TALKS

2020	Space Telescope Science Institute, online due to COVID-19.
2019	XVIII Physics & Chemistry Forum, UPR Arecibo, Puerto Rico.
2019	Arecibo Observatory, Puerto Rico.
2019	MMUF Southeastern Regional Conference. Houston, Texas.
2019	12th Knowledge Cities World Summit. Florianópolis, Brasil.
2019	Harvard-Smithsonian CfA, Cambridge, Massachusetts. (Video recording).
2019	Puerto Rico Astronomy Society. San Juan, Puerto Rico.
2018	XVII Physics & Chemistry Forum, UPR Arecibo, Puerto Rico.
2018	1st Philosophy Symposium, PCUPR, Ponce, Puerto Rico.

LANGUAGES

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

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