BAYRON PORTILLA REVELO

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Employment

(2024-present) Postdoctoral scholar, The Pennsylvania State University

(2019 - 2023) PhD in Astronomy *(Promovendus)*, University of Groningen, the Netherlands
Advisor: Prof. Dr. Inga Kamp
Co-advisor: Prof. Dr. Ewine van Dishoeck
Thesis: Closing the gap between theory and observations of planet-forming disks with radiative transfer models

Education

(2016 - 2019) MSc, Physics, Universidad de Antioquia, Colombia
Advisor: Prof. Dr. Jorge Iván Zuluaga Callejas.
Research project: The dynamics of S-type planets during the early phases of stellar evolution.

(2009 - 2015) Hon. B.S., Astronomy, University of Antioquia, Colombia
Advisor: Prof. Dr. Pablo Andrés Cuartas Restrepo.
Research project: Dynamical evolution due to bodily tides in multiple planetary systems.

Research interests

Protoplanetary and circumplanetary disks; planet and moon formation; radiative transfer simulations; hydrodynamical simulations; N-body simulations; secular and resonant perturbations; tides and spin-orbit coupling; astrostatistics and machine learning methods for astrophysics; data reduction techniques for sub-mm, infrared, and X-ray observations.

Referred publications

1st-2nd author:

1. Constraining the gas distribution in the PDS 70 disk as a method to assess the effect of planet-disk interactions (2023). **Portilla-Revelo, B.**, Kamp, I., Facchini, S., et al., Astronomy and Astrophysics, Volume 677, id.A76,16 pp.

2. Self-consistent modelling of the dust component in protoplanetary and circumplanetary disks: the case of PDS 70 (2022). **Portilla-Revelo, B.**, Kamp, I., Rab, Ch., et al., Astronomy and Astrophysics, Volume 658, id.A89,13 pp.

3. Revisiting the dynamics of planets in binaries: evolutionary time-scales and the effect of early stellar evolution (2019). **Portilla-Revelo, B.,** and Zuluaga, J., Monthly Notices of the Royal Astronomical Society, Vol. 485, Issue 1, Pages 522-540

Additional publications:

4. Mapping the Vertical Gas Structure of the Planet-hosting PDS 70 Disk (2023). Law, C. J., et al. (incl. **Portilla-Revelo, B.**), ApJ, in press.

5. Spin-orbit evolution of GJ 667C system: the effect of composition and other planets' perturbations (2016). Cuartas-Restrepo, P. A., et al., (incl. **Portilla-Revelo, B.**), Monthly Notices of the Royal Astronomical Society, Vol. 463, Issue 2, Pages 1592-1604.

Works in Preparation:

6. On the multiplicity of CO ice-lines in Circumplanetary Disks. **Portilla-Revelo, B.**, Kamp, I., et al.

Honors and Awards

- 2022 & 2023: Leids Kerkhoven-Bosscha Fonds - LKBF. Subsidy for conference participation and work visit.
- 2017-2018: COLCIENCIAS young researcher fellow
- 2016-2017: Teaching assistantship for master students, University of Antioquia
- 2016: Otto de Greiff National Contest. First place in the natural science category
- 2016: 100% Tuition waiver to participate in the Dunlap Summer School-Introduction to Astronomical Instrumentation. University of Toronto.
- 2015: Dean's award to the bachelor thesis, University of Antioquia

Presentations (* denotes invited)

- Jan-2024: Center for Exoplanets and Habitable Worlds Seminar, Department of Astronomy and Astrophysics, The Pennsylvania State University. *"Closing the gap between theory and observations of planet-forming disks with radiative transfer models".*
- *Jun-2023: Institute seminar, Instituto de Astronomía y Ciencias Planetarias, Universidad de Atacama. *"Closing the gap between theory and observations of planet forming regions with thermo-chemical models".*
- *May-2023: PSF coffee talk, Max-Planck-Institut für Astronomie, Heidelberg, Germany. *"Closing the gap between theory and observations of planet forming regions with thermo-chemical models".*
- Feb-2023: Dutch Exomoon and Circumplanetary Disk Meeting, Groningen, The Netherlands. *"On the multiplicity of CO icelines in circumplanetary disks"*
- Nov-2022: Disk and Planets across ESO Facilities, ESO headquarters in Garching, Germany. *"Closing the gap between theory and observations of planet forming regions with thermo-chemical models"*
- Feb-2022: Kapteyn Astronomical Institute, ISM group seminar. *"Modelling the continuum and line emission from the PDS 70 disk"*

- Nov-2021: NOVA Network II meeting, Leiden Observatory. *"Self-consistent modelling of the dust component in protoplanetary and circumplanetary disks: the case of PDS 70"*
- *Aug-2021: Universidad de Antioquia, Programa Orígenes. *"Modelos de transferencia radiativa en regiones de formación planetaria: el caso de PDS 70"*

Training and Complementary Education

- (Mar-2023) Astronomical Data Science with Python - Netherlands eScience Center workshop. Dwingeloo, the Netherlands.
- (Oct-2022) ALMA Science Archive School. Italian ARC node headquarters.
- (Sep-2022) JWST data reduction workshop. Leiden University.
- (Sep-2022) Ninth European Radio Interferometry School - ERIS 2022. Netherlands Institute for Radio Astronomy & Joint Institute for VLBI.
- (Aug-2022) International Advanced Study Institute Summer School in Celestial Mechanics Theory and Applications (CELTA) - From Stardust to Extrasolar Planets: Dynamics of Exoplanetary and Solar System Bodies. UHI Inverness and Sabhal Mor Ostaig Isle of Skye.
- (Aug-2020) IMPRS Summer School-Planet Formation in Protoplanetary Disks. University of Heidelberg.
- (Aug-2016) Dunlap Institute Summer School-Introduction to Astronomical Instrumentation. University of Toronto.
- (May-2014) Observing trip to Pico dos Dias observatory, Brasil.

Teaching experience

- (2020-2023) Teaching assistant: Interstellar Medium - Tutorial. University of Groningen.
- (2018-2019) Teaching assistant: Computational Methods in Physics - Lecture. Universidad de Antioquia.
- (2017-2018) Teaching assistant: Celestial Mechanics - Lecture. Universidad de Antioquia.
- (2016-2017) Teaching assistant: Celestial Mechanics - Tutorial. Universidad de Antioquia.
- (2015-2017) Teaching assistant: Fundamentals of Science - Tutorial. Universidad de Antioquia.

Technical skills

- **Programming Languages:** Python, C, Bash, Mathematica
- **Specialised software:** MCMax3D, ProDiMo, RADMC-3D, SAOImageDS9, RADEX, Fargo3D
- **Data reduction software and numerical libraries:** CASA, astropy, pandas, numpy, scikit-learn