Karolina Garcia

Astronomy PhD Candidate

- **Address:** 3214 Bryant Space Science Center, Office 309, FL 32607
- **E-mail:** karolina.garcia@ufl.edu
- **LinkedIn:** linkedin.com/in/karolinagarcia
- **Page:** karolinagarcia.github.io

Cosmologist developing mathematical tools and simulations to study the evolution history of the Universe. Throughout the last few years, developed a more robust way of computing the 3PCF of galaxies; promoted tests to one of the Euclid's algorithms for finding galaxy clusters; optimized survey strategies for measuring peculiar velocity fields with Type Ia supernovae; and helped build the pipeline for supernova detection with J-PAS and J-PLUS. Currently working on modeling molecular line emission in cosmological simulations to produce realistic predictions from galaxy and line intensity mapping observations.

Education

2018-07 – Current	**Ph.D.: Astronomy**
	University of Florida -- Gainesville, FL, USA
	• Emphasis on Cosmology
	• GPA: 3.86/4.00

2016-03 – 2018-04	**Master of Science: Astronomy**
	Federal University of Rio de Janeiro – Rio de Janeiro, RJ, Brazil
	• Emphasis on Cosmology
	• GPA: 2.54/3.00

2010-03 – 2014-12	**Bachelor of Science: Industrial Engineering**
	Pontifical Catholic University of Rio de Janeiro – Rio de Janeiro, RJ, Brazil
	• Bachelor in Industrial Engineering — Minor in Entrepreneurship
	• Supplementary courses in logistics and supply chain management, procurement strategies, applied computational intelligence, and social entrepreneurship.
	• GPA: 8.2/10

Research and Teaching Experience

2018-08 – Present	**Graduate Researcher**
	University of Florida -- Gainesville, FL, USA
	• Expert in modeling the light coming from interstellar regions in cosmological hydrodynamical simulations. This allows for galaxy evolution studies, and Line Intensity Mapping observation modeling and forecasts;
	• Developed new methods for improving the 3-point correlation function analysis in galaxy surveys such as DESI;
	• Worked on one of Euclid's galaxy cluster detection pipeline, and applied it to Spitzer data to find high-redshift clusters.

2021-01 – 2021-12	**Teaching Assistant**
	University of Florida -- Gainesville, FL, USA

- **Spring 2021, Class: Discover the Universe** – Assisted undergraduate students with different backgrounds in various activities, projects and discussion forums for introductory Astronomy.

- **Fall 2021, Class: Observational Techniques** – Assisted Astronomy undergraduate students on their first contact with telescopes and observing nights, as well as how to post process and analyze data using python.

2018-07 – 2018-08	**Board of Education (BOE) Fellow**
	University of Florida -- Gainesville, FL, USA

- Participated in professional development workshops, graduate seminar, and academic writing classes;
- Performed completeness and purity tests on one of the Euclid's algorithms for finding galaxy clusters.

2016-03 – 2018-04	**Graduate Researcher**
	Federal University of Rio de Janeiro – Rio de Janeiro, RJ, Brazil

- Conducted a theoretical study on how to optimize survey strategies in order to measure peculiar velocity fields with Type Ia supernovae;
- Helped develop the Type Ia supernova detection pipeline for J-PAS/J-PLUS surveys.

2015-09 – 2016-02	**Physics Teacher**
	INVEST Course – Rio de Janeiro. RJ, Brazil

- Helped low-income students get into accredited universities by teaching them physics once a week as a volunteer.

2012-08 – 2012-11	**Mathematics Tutor and Advisor**
	Colégio PH (Elementary, Middle and High school) – Rio de Janeiro, RJ, Brazil

- Tutored students ages 11 to 22 in Mathematics;
- Supported the educational development of students ranging from Elementary to High School and beyond;
- Helped 200+ students get into accredited Universities tutoring and giving guidance.

2011-09 – 2012-09	**Undergraduate Researcher**
	Pontifical Catholic University of Rio de Janeiro – Rio de Janeiro, RJ, Brazil

- Undergraduate research on the development of nanocomposites with negative thermal expansion.

Professional Service

- **Newsletter and Press Release Committee**
  Department of Astronomy, University of Florida, 2021 — present

Publications

- **Improving the Line of Sight for the Anisotropic 3-Point Correlation Function of Galaxies: Centroid and Unit-Vector-Average Methods Scaling as O(N2)**
  November, 2022 – MNRAS

- **On the amount of peculiar velocity field information in supernovae from LSST and beyond**
  September, 2020 - Physics of the Dark Universe

- **Ad Astra Academy: Using Space Exploration to Promote Student Learning and Motivation in the City of God, Rio de Janeiro, Brazil**
  March, 2020 - CAP Journal

- **J- PLUS: The Javalambre Photometric Local Universe Survey**
  February, 2019 - A&A

Community Involvement and Interests

- **Ad Astra Academy** - Educational outreach and documentary project whose objective is to inspire disadvantaged students to discover opportunities through science and exploration. I am part of the team since 2015. Website: adastra.world
- **AstroTubers** - Brazilian outreach Youtube channel that aims to make science accessible and enjoyable by everyone. I am one of the project's coordinators since 2017. Website: youtube.com/astrotubers

Industry Employment History

2015-08 – 2016-02

Finance Analyst

Royal Dutch Shell – Rio de Janeiro. RJ, Brazil
- Brazil's local responsible for Shell Lubricants' Global Key Accounts;
- Developed automated tools to calculate finance numbers, produce reports, and monitor business performance;
- Led improvements on Lubricants management information tools for more fit for purpose processes.

2015-04 – 2015-08

Pricing Strategy Consultant

Hyper Consulting Company – Rio de Janeiro, RJ, Brazil
- Participated in operational and strategic pricing analysis projects for Coca-Cola.

2013-08 – 2015-02

Finance Intern

Royal Dutch Shell – Rio de Janeiro, RJ, Brazil
- Interfaced with business and Brazil's Lubricants team to produce reports and monitor performance;
- Created automated tools to calculate commissions (+USD 0.5MM) paid to Shell Lubricants' Global Key Accounts, and monitor their performance in Brazil;
- Developed and implemented a graphical reporting tool that provides customized data related to volume of sales, costs, revenue and profit margins.

2013-07 – 2013-08

Facilities & Supply Management Intern

Vale S.A. -- Rio de Janeiro, RJ, Brazil
- Served as maintenance liaison & food catering supply coordinator at a multinational: one of the largest logistics operators in Brazil;
- Provided support and input to the development of work plans needed for negotiation and bid analysis.