

John F. Suárez-Pérez

Ph.D. in Science - Physics (Expected: June 2023)
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NASA/ADS: [ADS Abstract Service](#)

Research Interests

COSMOLOGY

Large-Scale Structure, Cosmic Web, Hydrodynamical Simulations.

EXTRAGALACTIC ASTRONOMY

Bright Galaxies, Luminous Red Galaxies, Galaxy Environment.

DATA SCIENCE

Machine Learning, Graph Algorithms, Data Mining.

Formal Education

- 2018 M.Sc. in Physics, Universidad de los Andes - Bogotá, Colombia, “Control experimental de las correlaciones en frecuencia de pares de fotones para una fuente de fotones individuales anunciados - Experimental Control of frequency correlations between photon pairs from an announced individual photons source”.
- 2014 B.S. in Physics, Universidad Distrital Francisco José de Caldas - Bogotá, Colombia, “Desarrollo de un aplicativo computacional para el estudio de circuitos con elementos memristivos - Computational software development for the study of circuits with memristive elements”.

Further Education

- 2021 MOOC, “Julia Scientific Programming”. University of Cape Town. [Coursera](#).
- 2020 MOOC, “Applied Machine Learning in Python”. University of Michigan. [Coursera](#).
- 2019 MOOC, “Electrones en Acción: Electrónica y Arduinos para tus propios Inventos”. Pontificia Universidad Católica de Chile. [Coursera](#).
- 2019 MOOC, “Introducción a la programación en Python I: Aprendiendo a programar con Python”. Pontificia Universidad Católica de Chile. [Coursera](#).

Invited Research Visits

- 2022 VISITING RESEARCHER. Natural Science Research Institute, University of Seoul. Seoul-Republic of Korea. August-October.
- 2022 VISITING RESEARCHER. Institute of Computational Cosmology, Durham University. Durham-UK. June-July.
- 2019 VISITING RESEARCHER. Max Planck Institute for Astrophysics. Munich-Germany. June.

Honors and Awards

- 2014 **Honour distinction for excellence in graduation work.** Laureate Thesis Award. Highest honour awarded for outstanding research work. Bachelor in Physics degree. Universidad Distrital Francisco José de Caldas - Bogotá, Colombia.

Publications, Events and Technologies

JOURNAL ARTICLES

- 2021 **Suárez-Pérez, John F.** - Camargo, Yeimy D. - Xiao-Dong, Li; Forero-Romero, Jaime E., “The four cosmic tidal web elements from the β -skeleton”, *The Astrophysical Journal - ApJ*, <https://iopscience.iop.org/article/10.3847/1538-4357/ac1fed/pdf>
- 2020 Neira, Mauricio - Gómez, Catalina - **Suárez-Pérez, John F.** - Gómez, Diego A. - Reyes, Juan Pablo - Hernández Hoyos, Marcela - Arbeláez, Pablo - Forero-Romero, Jaime E., “MANTRA: A Machine Learning reference lightcurve dataset for astronomical transient event recognition”, *The Astrophysical Journal Series - APJs*, <https://iopscience.iop.org/article/10.3847/1538-4365/aba267/pdf>
- 2020 **Suárez-Pérez, John** - Valencia, Alejandra - Nuñez, Mayerlin, “Characterization of spectrally filtered heralded single photons”, *Journal of the Optical Society of America B*, doi: <https://doi.org/10.1364/JOSAB.387118>

EVENTS

- 2022 **Suárez-Pérez, John** - Forero-Romero, Jaime E., DESI Team, “Assessing the quality of massive spectroscopic surveys with unsupervised machine learning” - *XXXI IAUGA 2022*, Busan, Republic of Korea, Speaker.
- 2022 **Suárez-Pérez, John** - Forero-Romero, Jaime E., DESI Team, “Assessing the quality of massive spectroscopic surveys with unsupervised machine learning” - *ESA/ESO SCIOPS WORKSHOP 2022*, Remote - Max Planck Institute, Garching-Munich, Germany, Speaker.
- 2021 **Suárez-Pérez, John** - Neira, Mauricio - Gómez, Catalina - Hernández Hoyos, Marcela - Arbeláez, Pablo - Forero-Romero, Jaime E., “TAO: Transient Astronomical Object Image Dataset” - *Statistical Challenges in Modern Astronomy VII*, Remote - The Pennsylvania, Bogotá-Colombia, Speaker.

- 2020 **Suárez-Pérez, John** - Forero-Romero, Jaime - Camargo, Yeimy Xiao, Dong-Li, “From the β -skeleton to cosmic web elements” - *Latin American Workshop on Observational Cosmology*, Remote - ICTP-SAIFR, São Paulo-Brazil, Speaker.
- 2020 **Suárez-Pérez, John** - Forero-Romero, Jaime - Camargo, Yeimy Xiao, Dong-Li, “From the β -skeleton to cosmic web elements” - *2nd CoCo meeting (Cosmología en Colombia)* , Remote - Universidad Antonio Nariño, Bogotá-Colombia , Speaker.
- 2019 **Suárez-Pérez, John** - Forero-Romero, Jaime, “Machine Learning to reconstruct the dark matter density fields from galaxy survey” - *XVI Latin American Regional IAU Meeting*, Universidad de Antofagasta, Antofagasta-Chile , Speaker.
- 2019 **Suárez-Pérez, John** - Forero-Romero, Jaime, “Reconstructing the Universe with Machine Learning” - *VI Congreso Colombiano de Astronomía y Astrofísica*, Parque Explora - Universidad de Antioquía, Medellín-Colombia , Speaker.
- 2019 **Suárez-Pérez, John** - Forero-Romero, Jaime, “Understanding the large scale dark matter distribution with machine learning algorithms”- *1st CoCo meeting (Cosmología en Colombia)*, Universidad Antonio Nariño, Bogotá-Colombia, Speaker.

TECHNOLOGIES

- 2014 **Suárez, John** - Castillo, Miguel - Salamanca, Julián, “Memcircuit”, Software for the study of memristive circuits, *Scientific Software*, 1-2014-64122.

Researching

- 2019 RESEARCH ASSISTANT. Universidad de los Andes, Trasients Project: Localize Transient Astronomical Objects on image sequences.

Teaching

- 2018-2022 GRADUATE ASSISTANT PH.D. Universidad de los Andes. Computer Vision, Computational Methods, Basic Physics I.
- 2016-2017 GRADUATE ASSISTANT M.SC. Universidad de los Andes. Experimental Physics I, Experimental Physics II, Basic Physics I Laboratory, Physics I, Physics II, Modern Optics.
- 2015-2015 ADJUNCT PROFESSOR. Universidad de los Andes. Experimental Physics I, Experimental Physics II.

Outreach

- 2021-2022 MEMBER, *Red de Estudiantes Colombianos de Astronomía - RECA* mentorship program committee. A program focused on guiding students in Colombia who are interested in becoming professional astronomers.
- 2020-2021 EDITOR AND TUTOR, *DESI High: School of the Dark Universe* initiative, a project of DESI members focusing on introducing DESI to high schoolers through introductory notebooks written in python.

Skills and Abilities

SOFTWARE DEVELOPMENT SKILLS

Python: ●●●●●●

Bash: ●●●●●●

C++: ●●●●●●

Julia: ●●●●●●

SOFTWARE TOOLS

Visualization: ●●●●●●
matplotlib, gnuplot

Machine Learning: ●●●●●●
sklearn, pytorch

Data Analysis: ●●●●●●
numpy, scipy, pandas

Others: ●●●●●●
git, make

LANGUAGES

Spanish: ●●●●●●

Esperanto: ●●●●●●

English: ●●●●●●

Scientists Prof. Jaime Forero-Romero (je.forero@uniandes.edu.co), Prof. Shaun Cole (shaun.cole@durham.ac.uk) and Prof. Cristiano Sabiu (csabiu@uos.ac.kr) have agreed to send reference letters for my application. Please do not hesitate to contact me should you require further information.

Last updated: November 22, 2022 •