John F. Suárez-Pérez

Ph.D. in Science - Physics (Expected: July 2023)
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Research Interests

COSMOLOGY
Large-Scale Structure, Cosmic Web, Hydro-dynamical Simulations.

EXTRA-GALACTIC ASTRONOMY
Bright Galaxies, Luminous Red Galaxies, Galaxy Evolution.

DATA SCIENCE
Artificial Intelligence, Graph Algorithms, Data Mining.

Formal Education

2017   M.SC. in Physics, Universidad de los Andes - Bogotá, Colombia, "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, "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 | **Honor distinction for excellence in graduation work.** Laureate Thesis Award. Highest honor awarded for outstanding research work. Bachelor in Physics degree. Universidad Distrital Francisco José de Caldas - Bogotá, Colombia. |

Publications, Events and Technologies

JOURNAL ARTICLES

| 2023 | DESI Collaboration - Adame, A.G.- Aguilar, J. - **et.al.**, "The Early Data Release of the Dark Energy Spectroscopic Instrument", *The Astrophysical Journal - ApJ*, https://arxiv.org/abs/2306.06308 |

| 2023 | DESI Collaboration - Adame, A.G.- Aguilar, J. - **et.al.**, "Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument", *The Astrophysical Journal - ApJ*, https://arxiv.org/abs/2306.06307 |

| 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

| 2023 | **Suárez-Pérez, John** - Forero-Romero, Jaime E., "Assessing the quality of massive spectroscopic surveys with unsupervised machine learning" - *Machine Learning to 1D Astronomical Dataset*, Remote - London, United Kingdom, **Speaker**. |

| 2022 | **Suárez-Pérez, John** - Forero-Romero, Jaime E., "Assessing the quality of massive spectroscopic surveys with unsupervised machine learning" - *XXXI IAUGA 2022*, In-Person - IAU, 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 University - **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**.

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*. In-Person - IAU, Universidad de Antofagasta, Antofagasta, Chile - **Speaker**.

TECHNOLOGIES

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

Researching

2020-2023   Collaborator, *Dark Energy Spectroscopic Instrument - DESI* member collaborator, Galaxy and Quasars Physiscs, Anomaly Detection, Lyman α Working Groups.

2019   RESEARCH ASSISTANT. Universidad de Los Andes, Transients Project: Localize Transient Astronomical Objects on image sequences.

Teaching

2018-2023   GRADUATE ASSISTANT PH.D. Universidad de Los Andes. Computer Vision, Introduction to Data Science, Computational Methods, 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

2021-2023   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
others*

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

Others: ● ● ● ● ●
git, make, conda

LANGUAGES

Spanish: ● ● ● ● ●

English: ● ● ● ● ○

Esperanto: ● ● ● ○ ○

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.