John F. Suárez-Pérez

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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, Galaxies Alignment.

Data Science
Machine/Deep Learning, Foundation Models, Graph Algorithms.

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 sofware 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.

2022 Visiting Researcher. Intitute of Computational Cosmology, Durham University. Durham-UK. June-July 2022.

2019 Visiting Researcher. Max Planck Institute for Astrophyscis. Munich-Germany. June 2019.

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. 2014.

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 -skeleton", *The Astrophysical Journal - ApJs*, 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.

Researching

2019 Research Assistant, Universidad de los Andes, Trasients Project: Localize Transient Astronomical Objects on image sequences.

Teaching

2021 Graduate Assistant Ph.D., Universidad de los Andes, Computer Vision

2020 Graduate Assistant Ph.D., Universidad de los Andes, Computational Methods

2019 Graduate Assistant Ph.D., Universidad de los Andes, Basic Physics II

2018 Graduate Assistant M.Sc., Universidad de los Andes, Physics I, Physics II, Modern Optics

2017 Graduate Assistant M.Sc., Universidad de los Andes, Experimental Physics I, Laboratory of Basics Physics I

2016 Graduate Assistant M.Sc., Universidad de los Andes, Experimental Physics I, Experimental Physics II

2015 University Professor, Universidad de los Andes, Experimental Physics I, Experimental Physics II

Skills and Abilities

Software Development Skills

Python: ●●●●●

C++: ●●●●◐

Bash: ●●●●○

Julia: ●●●○○

Software Tools

Visualization: ●●●●●
matplotlib, gnuplot

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

Machine Learning: ●●●●○
sklearn, pytorch

Others: ●●●○○
git, make

Languages

Spanish: ●●●●●

English: ●●●●○

Esperanto: ●●●○○