

# 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, 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.
- 2022 VISITING RESEARCHER. Institute of Computational Cosmology, Durham University. Durham-UK. June-July 2022.
- 2019 VISITING RESEARCHER. Max Planck Institute for Astrophysics. 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  $\beta$ -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  $\beta$ -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, Transients Project: Localize Transient Astronomical Objects on image sequences.

## Teaching

- 2019-2022 GRADUATE ASSISTANT PH.D. Universidad de los Andes. Computer Vision, Computational Methods, Basic Physics I.
- 2016-2018 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.

## 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: ●●●●●

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