John F. Suárez-Pérez

Ph.D. in Science - Physics
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| Website | Github | NASA/ADS | Google Scholar |

Research Interests

DATA SCIENCE
Artificial Intelligence, Deep Learning, Computer Vision, Big Data.

COSMOLOGY AND ASTRONOMY
Large Scale Structure, Cosmic Web, Galaxy Evolution.

Formal Education

2018.01 2023.08
PH.D. in Physics, Universidad de los Andes - Bogotá, Colombia, "Artificial Intelligence in Astronomy: Machine Learning and Deep Learning Approaches to DESI Data".
Advisor: Jaime Forero-Romero.

2015.01 2017.11
M.SC. in Physics, Universidad de Los Andes - Bogotá, Colombia, "Experimental Control of frequency correlations between photon pairs from an announced individual photons source".
Advisor: Mayerlín Nuñez Portela.

2008.02 2014.11
B.S. in Physics, Universidad Distrital Francisco José de Caldas - Bogotá, Colombia, "Computational software development for the study of circuits with memristive elements".
Advisor: Julian Salamanca Bernal.

Research Experience

2019.07 2019.12
Research Assistant, Universidad de Los Andes, Transients Project: Localize Transient Astronomical Objects on image sequences.

Teaching

2023.09 Present
ADJUNCT PROFESSOR. Universidad de América. Data Analytics, Big Data Analytics.

2018.01 2023.08
GRADUATE ASSISTANT PH.D. Universidad de Los Andes. Computer Vision, Computational Methods, Introduction to Data Science, Physics I.

2016.01 2017.11
GRADUATE ASSISTANT M.SC. Universidad de Los Andes. Experimental Physics I, Experimental Physics II, Basic Physics I Laboratory, Physics I, Physics II, Modern Optics.

2015.01 2015.11
ADJUNCT PROFESSOR. Universidad de Los Andes. Experimental Physics I, Experimental Physics II.

Collaborations

2020.04
Present
   MEMBER, *Dark Energy Spectroscopic Instrument - DESI* member collaborator. Data, Galaxy and Quasars Physics, and Anomaly Detection Working Groups.

Outreach

2021.05
Present
   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.

2020.04
2021.12
2023.05
Present
   EDITOR AND TUTOR, *DESI High: School of the Dark Universe* initiative of the Educational and Public Outreach (EPO) working group, a project of DESI members focusing on introducing DESI to high schoolers through introductory notebooks in Google Colab written in Python Language.

Invited Research Visits

2022.08
2022.11
   VISITING RESEARCHER. Natural Science Research Institute, University of Seoul. Seoul, Republic of Korea.

2022.06
2022.07
   VISITING RESEARCHER. Institute of Computational Cosmology, Durham University. Durham, UK.

2019.06
   VISITING RESEARCHER. Max Planck Institute for Astrophysics. Munich, Germany.

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.

Software Development

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

Publications

2024
   DESI Collaboration - Adame, A.G.- Aguilar, J. - **et.al.**, Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument, *The Astronomical Journal - AJ.*

2023
   DESI Collaboration - Adame, A.G.- Aguilar, J. - **et.al.**, The Early Data Release of the Dark Energy Spectroscopic Instrument, *The Astronomical Journal - AJ (Submitted).*

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.*

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.*

2020   **Suárez-Pérez, John** - Valencia, Alejandra - Nuñez, Mayerlin, Characterization of spectrally filtered heralded single photons, *Journal of the Optical Society of America B.*

Selected Talks

2022   **Suárez-Pérez, John** - Forero-Romero, Jaime E., "Assessing the quality of massive spectroscopic surveys with unsupervised machine learning" - *XXXI IAUGA 2022*, Busan, Republic of Korea, **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, United States, **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*, Hotel de Antofagasta - Universidad de Antofagasta, Antofagasta-Chile, **Speaker**.

2018   **Suárez-Pérez, John** - Alvis, Elkin R.- Gonzaléz, Juan - González, María - Cuadrado, Marcela - Aguilera, Alejandra, Bermudez, Santiago - *1st Joint Symposium in Optics: Topics on nonlinear phenomena*, Universidad Nacional - Universidad de los Andes, Bogotá-Colombia, **Organizer**.

2017   **Suárez, John** - Nuñez, Mayerlin - Valencia, Alejandra, "Experimental Control of Frequency Correlations of Entangled Photon Pairs", *VI Quantum Information School and Workshop*, Sociedade Brasilera de Fisica, Paraty-Brasil, **Speaker**.

Skills and Abilities

Software Development Skills

Python: ●●●●●   Bash: ●●●●○

C++: ●●●●◖   Julia: ●●●○○

Languages

Spanish: ●●●●●

English: ●●●●○   Esperanto: ●●●○○

SOFTWARE TOOLS

| Visualization: | ● ● ● ● ● | Machine Learning: | ● ● ● ● ● |
matplotlib, gnuplot | | *sklearn, pytorch* |
| | | *others* |

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

Others: ● ● ● ● ●
git, make, conda

Scientist Prof. Jaime Forero-Romero (je.forero@uniandes.edu.co) has agreed to send reference letters for my application. Please do not hesitate to contact me should you require further information.