Juan S. Rojas

PhD Student - Okinawa Institute of Science and Technology

Email: jvelez_r@ictp.it
Github: github.com/JS-Rojas
Web: Personal Webpage
Google Scholar: Juan S. Rojas
Kaggle: kaggle.com/juansrojas

EDUCATION

PhD Student 2026-2030
Okinawa Institute of Science and Technology (OIST)

Postgraduate Diploma Programme in Quantitative Life Science 2024-2025
International Centre for Theoretical Physics, a UNESCO category 1 institute.

Bachelor in Physics 2018-2023
School of Physics Science and Nanotechnology, Yachay Tech University

RESEARCH PROJECTS

Knowing to Know: A Simple Model for Machine Awareness 2025
Developing a formal measure to quantify awareness in artificial systems.
Supervisors: Matteo Marsili and Alessandro Ingrosso, Ph.Ds

Chaotic Griffiths Phase in Neuron Maps (Preprint in preparation) 2024
Studied and classify heterogeneity that drives criticality in neural dynamics.
Co-author: Mario Cosenza, Ph.D

Modeling Cultural Oscillations: Google Trends Study (Ongoing) 2024
Modified Axelrod model with periodic external fields to replicate trends in Google data.

Silver Nanoparticles and Antibacterial Activity (Published) 2024
Synthesized nanoparticles using Moringa oil; tested on E. coli.
Advisor: Sarah Briceño and Francisco J. Alvarez, Ph.Ds

Bachelor Thesis: Griffiths Phase in Dynamical Networks 2023
Investigated critical behavior in brain dynamics via coupled map-based neurons.
Advisor: Mario Cosenza, Ph.D

Chimera States in neuronal dynamics 2022
Research assistant in nationally founded project.
Advisor: Mario Cosenza, Ph.D

LEADERSHIP EXPERIENCE

Podcast Developer, Neurona Errante 2023 - 2024
Hosted discussions with international scientists about curious phenomena and critical perspectives.

Co-Director, Minicourse on Complex Systems 2023
Led Ecuador's first minicourse on physical statistics in complex systems, LaConga-funded.

Co-Director, COSSY School 2023
Organized the first Complex Systems School in Ecuador at Yachay, funded by ICTP.

Student Representative, GISC 2022-2023
Represented students in the Interdisciplinary Complex Systems Group.

WORKSHOPS, SCHOOLS AND INTERNSHIPS

Spring College of Complex Systems 2025
ICTP, Trieste. Modality: Face to face.

Konstanz School of Collective Behaviour 2024
Konstanz University, Germany. Modality: Face to face.
Spring College of Complex Systems 2024
ICTP, Trieste. Modality: Face to face.
Minicourse on Lattice models on biological problems 2023
ICTP-SAIFR, Brasil. Modality: Face to face.
Workshop on Signatures of Nonequilibrium Fluctuations in Life 2023
ICTP, Trieste. Modality: Face to face.
3rd Latin American Conference on Complex Networks (LANET) 2023
Universidad del Pacífico, Peru. Modality: Face to face.
Conference Presentation about Computational Physics 2023
AMV Phys 2023 at Yachay Tech. Modality: Face to Face.
School on Information, Noise, and Physics of Life 2022
ICTP. Modality: Online.
Internship on CIITT: Information measures behind time series 2022
Research, Innovation and Technology Transfer Centre. Modality: Face to face.
Data visualization with Python 2022
NanoPhysics day at Yachay Tech. Modality: Face to Face.

AWARDS

Second Place, Dorothy Coding Challenge 2023
Three Ecuadorian Universities with ICTP-WF.
Best Poster, LANET Conference (International) 2023
Griffiths Chaotic Phase in Dynamical Networks — Universidad del Pacífico, Peru.
Best Poster, NanoPhysics Day Vol.2 2023
Griffiths Phase in Networks: A Mechanism for Emergence of Conscious Brain States — Yachay Tech University.

EXTRACURRICULAR ACTIVITIES

Hult Prize Finalist, BioPink Project 2022
Developed biotech solutions for sustainable shrimp farming.
Advisor: Danilo Mendoza
Co-founder, Entrepreneur Club 2022
Filling the gap industry-academia partnerships to address key challenges.
Advisor: Claudio Arcos, Ph.D.

ONLINE COURSES

Model Thinker 2024
Mathematical and computational models for complex problems.
Scott Page, Michigan University
Nonlinear Dynamics 2024
Mathematics and tools for studying chaotic systems.
Elizabeth Bradley, Santa Fe Institute

SKILLS

Languages:	Spanish (native language) English (B2)
Programming Languages:	Python, Mathematica, R, LaTeX, VASP, Shell
Other:	Visual Material Studio, GIMP, Audacity

Signature