Julian Giraldo-Barreto

Biophysics of Tropical Diseases - Max Planck
Tandem Group.
Magnetism and simulation group, G+.
Institute of Physics
University of Antioquia, Medellín, Colombia.
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Education

University of Antioquia	MSc	Physics	Feb, 2020 - Present
University of Antioquia	B.Sc.	Physics	Jul, 2013 - Dec, 2019

Work Experience

Guest Researcher May, 2021 - Present
Flatiron Institute
I have recently joined to Flatiron Institute as guest researcher. The investigation project to which I belong uses mathematical and computational tools to work in the study of macromolecular systems, in particular using cryo-em experimental images.

Graduate Research Assistant Oct, 2019 - Present
Biophysics of Tropical Diseases - Max Planck Tandem Group
I have recently joined in the BioTD research group as a Research Assistant to pursue my MSc. I have developed a collective variable to extract free energy profiles from cryo-EM projections from a Bayesian perspective.

Graduate Research Assistant Oct, 2018 - Present
Magnetism and Simulation Group, G+
I am working in a tax evasion percentage study by means of identifying social parameters like government, information exchange, and some aspects of social behavior, with physical parameters, like magnetic field or temperature, as a diluted Ising-type system with competing interactions.

Group Tutor - Mathematics and Physics Jul, 2017 - Nov, 2019
University of Antioquia
I worked teaching mathematics and physics to High School students as a part of the academic stimulus system for bachelor students. Preparing lectures and didactic material was part of my labors as a tutor.

Publications

Accepted papers

- Julian Giraldo-Barreto, Sebastian Ortiz, Erik H. Thiede, Karen Palacio-Rodriguez, Bob Carpenter, Alex H. Barnett, Pilar Cossio. A Bayesian approach to extracting free-energy profiles from cryo-electron microscopy experiments. Sci. Rep. 11, 13657 (2021) http://www.nature.com/articles/s41598-021-92621-1

- Julian Giraldo-Barreto and Johans Restrepo. Tax evasion study in a society realized as a diluted Ising model with competing interactions. Phys. A Stat. Mech. its Appl. 582, 126264 (2021). https://linkinghub.elsevier.com/retrieve/pii/S0378437121005379

Research Interests

- Biophysics
- Econophysics - Sociophysics
- Statistical Physics
- Theoretical Physics

Skills

Programming: Pyhton, Bash
OS Proficiency: Linux *Ubuntu*, *mint*, Windows

Conferences and workshops

1. *2021* One World Cryo-EM. cryo-BIFE: Cryo-EM Bayesian Inference of Free Energy profiles. Virtual event. Poster.
2. *2019* Latin American Workshop in Structural Bioinformatics of Proteins. Medellín/Antioquia, Colombia. Participant.

3. *2019* XVIII Congreso Nacional de Física (Physics National Meeting). Computational study of the percentage of tax evasion in a society of agents modeled as an Ising-type spin glass system. Armenia/Quindío, Colombia. Speaker.

4. *2019* XVIII Congreso Nacional de Física (Physics National Meeting). Measurement of Avogadro number based on Einstein's equation for Brownian motion. Armenia/Quindío, Colombia. Poster.

5. *2019* X Escuela de Física Matemática (Mathematical-Physics Workshop) - Machine learning for quantum matter and technology. Bogotá, Colombia. Participant.

Languages:

1. **Spanish:** Native

2. **English:** *Reading:* Good. ; *Speaking:* Intermediate. ; *Writing:* Intermediate.