

Mateo Restrepo Ayala

Physics Department Universidad de los Andes
Carrera 1 #18A-12
Bogotá - Colombia

Mobile: +57 314-257-7884

Email: m.restrepo11@uniandes.edu.co

Github: <https://github.com/m-restrepo11>

Nationality: Colombian

Education

- 2017-2019 **M.Sc. in Physics**, Universidad de los Andes, Bogotá, Colombia.
GPA: 4.45/5
- 2012-2016 **B.Sc. in Physics**, Universidad de los Andes, Bogotá, Colombia.
GPA: 4.38/5. THESIS: *"Investigation of the Physics of the Sorkin-Johnston state as a distinguished vacuum state for quantum field theory in curved Spacetimes"*
- 2013-2016 **MINOR in Mathematics**, Universidad de los Andes, Bogotá, Colombia.
GPA: 4.40/5

Current Position

- 2017-2019 **GRADUATE RESEARCH ASSISTANT**, Theoretical physics group at physics department Universidad de los Andes, Bogotá, Colombia.

Areas of Interest

Quantum field theory • Condensed matter & many-body physics • Machine learning • Information theory • Complex systems

Publications

- 2017 A random number generator based on polarized photons. *Emergent Scientist Vol 1- 2*.

Programming Skills

Systems: Linux, MsWindows.

Development: Python, C, C++, Java, Bash.

Software: Mathematica, \LaTeX .

Tools: Tensorflow, Pandas, Sckit-learn.

Research Experience

- 2018 **SUMMER RESEARCH INTERNSHIP.** Under the supervision of Andrés F. Reyes-Lega. *Quantum Quenches and two-dimensional electrodynamics: Dirac operator spectrum evolution and chiral anomaly.* Universidad de los Andes.
- 2017 **SUMMER RESEARCH INTERNSHIP.** Under the supervision of Andrés F. Reyes-Lega. *Computation of the entanglement entropy of a causal diamond in 1+1 dimensions with the Sorkin-Johnston state.*, Universidad de los Andes.
- 2017 **RESEARCH PROJECT** *Quantum state tomography of entangled qubit pairs*, Quantum optics group, Universidad de los Andes.
- 2018 **RESEARCH GRANT** *Schwinger model: spectrum, dynamics and quantum quenches*, Seed project grant, science faculty, Universidad de los Andes.

Languages

Spanish: Native
English: Fluent, TOEFL iBT: 108/120
German: Basic

Teaching & professional Experience

- 2017-2019 **GRADUATE TEACHING ASSISTANT:** Experimental Physics I, Experimental Physics II , Physics I - Recitation Section, Physics II - Recitation Section.
- 2017 **ORGANIZER AND LECTURER:** Graduate Student Seminar in quantum field theory .
- 2013-2015 **TEACHING ASSISTANT:** Clinic for Problem-Solving: an undergraduate problem solving lab. Physics Department Universidad de los Andes.
- 2013-2016 **UNDERGRADUATE TEACHING ASSISTANT:** Honors Differential Calculus, Honors Vector Calculus, Physics I, Physics II, Classical Mechanics, Quantum Mechanics I, Quantum Mechanics II

Grants, honors & awards

- 2018 **SEED PROJECT GRANT** financing research projects and attendance to academic events. Science faculty, Universidad de los Andes.
- 2017 **TEACHING ASSISTANTSHIP** covering tuition fees for M.Sc. studies. Physics department, Universidad de los Andes.
- 2012 **ALBERTO MAGNO GRANT** for undergraduate tuition fee. Universidad de los Andes.
- 2012 Best score in the Colombian national exam for High-school ICFES.

Conferences, Schools & Workshops

- 2018 *Q-Turn: changing paradigms in quantum science.* UFSC, Florianopolis, Brazil.
- 2018 *Ninth School of Mathematical Physics: Topological order and beyond.* Universidad de los Andes.

- 2017 *Workshop on Dynamic of quantum systems out of equilibrium.* Universidad de los Andes.
- 2017 *Minicourse on machine learning for many-body physics.* ICTP-SAIFR, Sao Paulo, Brazil.
- 2017 *Tenth Summer School on Geometric, Algebraic and Topological Methods for Quantum Field Theory.* Universidad de los Andes, Villa de Leyva, Colombia.
- 2016 *Journeys into Theoretical Physics.* IFT-Perimeter-SAIFR, Sao Paulo, Brazil.
- 2016 *Eight School of Mathematical Physics: Random Geometries.* Universidad de los Andes.
- 2016 *Member of the first Colombian team at the International Physicist's Tournament.* Société Française de Physique, Paris, France.
- 2015 *Andean School on Gravity and Cosmology.* Universidad de los Andes.
- 2015 *Theoretical Physics School on Quantum Field Theory.* Universidad del Norte y Universidad del Atlantico, Barranquilla, Colombia.
- 2015 *Ninth Summer School on Geometric, Algebraic and Topological Methods for Quantum Field Theory.* Universidad de los Andes, Villa de Leyva, Colombia.
- 2015 *Workshop on Mathematical Structure and Foundations of Quantum Physics.* Universidad de los Andes.
- 2015 *International Year of Light.* Universidad Nacional de Colombia & Universidad de los Andes.
- 2015 *Seventh School of Mathematical Physics: Topological Quantum Matter From Theory to Applications.* Universidad de los Andes.

Posters, Talks & Seminars

- 2018 **POSTER** *Lattice Schwinger model: Spectrum, dynamics and quantum quenches* Q-Turn quantum information workshop, UFSC, Florianopolis, Brazil.
- 2018 **SEMINAR** *Schwinger model continuum and discrete formulations* Quantum field theory and mathematical physics seminar at physics department, Universidad de los Andes.
- 2018 **SEMINAR** *Quantum quench dynamics in the Ising model and dynamical phase transitions* Quantum field theory and mathematical physics seminar at physics department, Universidad de los Andes.
- 2017 **SEMINAR** *2 dimensional conformal invariance.* Quantum field theory and mathematical physics seminar at physics department, Universidad de los Andes.
- SEMINAR** *The cosmological constant problem.* Theoretical Physics Seminar at physics department, Universidad de los Andes.
- 2016 **TALK** *Beyond the dark Universe? $f(R)$ gravitational alternatives.* Astroparticle physics course talks, Universidad de los Andes.
- 2016 **SEMINAR** *Field theory in curved spacetimes.* Theoretical Physics Seminar at physics department, Universidad de los Andes.
- 2016 **SEMINAR** *The Sorkin-Johnston state and entanglement entropy of bounded spacetime regions.* Quantum Field Theory Seminar at physics department, Universidad de los Andes.
- 2016 **SEMINAR** *Aspects of Field Quantization and the Sorkin-Johnston state for the Klein-Gordon field.* Physics Seminar by Students at physics department, Universidad de los Andes.
- 2015 **SEMINAR** *Stellar Equilibrium in White Dwarf Stars and the Chandrasekhar mass,* Theoretical Physics Seminar at physics department, Universidad de los Andes.
- 2015 **SEMINAR** *General Relativity and Gravitational Waves,* Physics Seminar by Students at physics department, Universidad de los Andes.