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My homepage
Birth date: 12/01/1995

Rodolfo Reis Soldati

Education

01/03/2019 – present **Ph.D. Physics — Supervisor: Prof. Gabriel T. Landi**, Physics Institute, USP, São Paulo, Brazil.
Project: Autonomous quantum absorption refrigerators using ultra-cold atoms in an optical cavity

2017 – 2018 **M.Sc. Physics — Supervisor: Prof. Nelson Yokomizo**, Dep. of Physics, ICEx, UFMG, Belo Horizonte, Brazil.
Dissertation title: Entanglement entropy in quantum field theory.

2014/2015 academic year **Visiting student — MPhys Theoretical Physics**, Level 2, Durham University, Durham, UK.
Awarded with the Science Without Borders scholarship.

2013 – 2016 **B.Sc. Physics**, Dep. of Physics, ICEx, UFMG.

Schools

July 2016 **IFT-Perimeter-SAIFR Journeys into Theoretical Physics**, ICTP-SAIFR.

August 2017 **XVI Brazilian School on Cosmology and Gravitation**, CBPF.

Jan/Feb 2018 **Mathematics Summer Programme**, UFMG.

June 2018 **1st Joint ICTP-Trieste/ICTP-SAIFR School on Particle Physics**, ICTP-SAIFR.

April 2019 **Minicourse on Quantum Gravity from the QFT perspective**, ICTP-SAIFR.

July 2019 **XXI Giambiagi Winter School — Quantum simulations and quantum metrology with cold trapped ions**, University of Buenos Aires.

September 2019 **School on Interaction of Light with Cold Atoms**, ICTP-SAIFR.

October 2019 **Predoc School on Interaction of Light with Cold Atoms**, Les Houches.

Research and experience

July 2013 – June 2014 **Institutional Program to aid the Research of Newly Licensed Doctors (PRPq scholarship)**, supervision by Prof. Ethan Cotterill, Department of Mathematics, UFMG.
Gonality of tree-decomposed graphs: identification of tree decomposition of metric graphs with the chip-firing burning algorithm and use of cut-and-join method for visualizing the embedding of graphs on Riemann sphere.

Summer 2015 **Final project for Science Without Borders programme**, supervision by Prof. Ian Terry, Centre for Materials Physics, Durham University.
Simulations with the software MCNP6 of the response of transistors to irradiation from the beta decay of Sr^{90} and Y^{90} and the characteristic X-ray spectrum of a Ag target.

2016 **Undergraduate research project**, supervision by Prof. Marcos Sampaio, UFMG.
Study of Poisson's spot with matter waves using path integral formulation and including effects of decoherence. We also noticed how Poisson's spot intensity is augmented when the Gouy phase shift is taken into account, leading to better fit of experimental data for interferometry of deuterium molecules.

2017 – 2018 **Master's degree research project**, supervision by Prof. Nelson Yokomizo, UFMG.
My master's degree research project is on the behaviour of universal contributions to entanglement entropy in field theory. It is known that the area law for entropy gets corrections due to curvature of spacetime, and we are looking for them using numerical methods and lattice regularisation for the fixed background of the Einstein universe.

Events

March 2016	II Workshop on Quantum Field Theory and Quantum Optics	UESC	Talk delivered on "Poisson spot with matter waves."
November 2017	Workshop Physics in the Department	UFMG	Talk delivered on "Quantum correlations for scalar field in closed spacetime."
November 2018	Workshop Physics in the Department	UFMG	Talk delivered on "Universal terms of the entanglement entropy in Einstein space."
Sep/Oct 2019	Predoc School on Interaction of Light with Cold Atoms	Les Houches	Poster on "Symmetry Breaking in a U(1) Dicke model."

Other projects

I am currently helping organise the Quantum Discussions seminar series at USP that aims to bring closer together research at the border between quantum information, condensed matter and high-energy physics.

I have been responsible from the second half of 2017 to 2018 for managing the weekly meetings of the Group for Fundamental Theory at UFMG, which include a seminar given by one of our members or invited speakers, and the "PI session", when we gather to watch the latest research seminars provided by the Perimeter Institute at PIRSA. I have also worked on setting up the group's webpage, at GFT.

Publications

2016 I. G. da Paz, Rodolfo Soldati, L. A. Cabral, J. G. G. de Oliveira, and Marcos Sampaio. Poisson's spot and Gouy phase. Phys. Rev. A, 94:063609, Dec 2016. [quant-ph:1609.09023v1].

In preparation R. R. Soldati, N. Yokomizo. Curvature corrections to entanglement entropy in the Einstein universe.

Languages

Portuguese Native

English Fluent