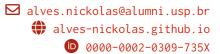
Níckolas de Aguiar Alves

PhD student in theoretical physics Federal University of ABC Santo André, SP, Brazil



Education

2023 - Ongoing

Doctor in Physics

Federal University of ABC, SP, Brazil Advisor: Dr. André G. S. Landulfo

2021 - 2023

Master in Physics

Federal University of ABC, SP, Brazil Advisor: Dr. André G. S. Landulfo

Thesis: Nonperturbative Aspects of Quantum Field Theory in Curved Spacetime

2017 - 2021

Bachelor in Physics

Institute of Physics, University of São Paulo, SP, Brazil

Advisor: Dr. João C. A. Barata

Academic Publications

Journal Articles

N. de Aguiar Alves, A. G. S. Landulfo, and B. A. Costa. "Positive Mass in General Relativity Without Energy Conditions". *Physical Review D* (2025). arXiv: 2408.00154 [gr-qc]. Forthcoming.

To Appear

- N. de Aguiar Alves. "Measurements Are Never Relative". Submitted.
- N. de Aguiar Alves, A. G. S. Landulfo, and A. D. Pereira. "Nonperturbative Renormalization Group Flow for a Particle Detector". In preparation.

Other

- 1 N. de Aguiar Alves. Lectures on the Bondi-Metzner-Sachs Group and related topics in infrared physics. 2025. In preparation.
- N. de Aguiar Alves. "Nonperturbative Aspects of Quantum Field Theory in Curved Spacetime". MSc thesis. Santo André, Brazil: Federal University of ABC, 2023. xxiv, 152 pp. arXiv: 2305.17453 [gr-qc].

Funding

2023 - Ongoing

PhD Scholarship

Coordenação de Aperfeiçoamento do Pessoal de Ensino Superior (CAPES), Social-Demand Program

Granted to pursue my PhD degree after placing first in UFABC's admission ranking

2021 - 2023

MSc Scholarship

São Paulo Research Foundation (FAPESP) Grant No. 2021/07372-7

Project: The Functional Renormalization Group in Quantum Field Theory in Curved

Spacetimes

Advisor: Dr. André G. S. Landulfo

Funding (continued)

2021 MSc Scholarship

Coordenação de Aperfeiçoamento do Pessoal de Ensino Superior (CAPES), Social-Demand

Program

Granted to pursue my MSc degree after placing first in UFABC's admission ranking

2019 - 2020

BSc Scholarship

São Paulo Research Foundation (FAPESP) Grant No. 2019/12158-4

Project: Hyperbolic Equations Advisor: Dr. João C. A. Barata

Academic Service

Conferences Organized

2023 Golden Wedding of Black Holes and Thermodynamics

Main organizer

Schools Organized

2024 I São Paulo School in Gravitational Physics

Main organizer

Founder and organizer of the first three editions

Miscellaneous

2018 Dead Physicists Society

Founded a student-driven organization still responsible for the organization of schools and seminars at IFUSP

2017 - Ongoing Several other events, seminars, and colloquia

Scientific Societies

2024 – Ongoing 📕 International Society for Quantum Gravity

Ordinary member

Teaching Experience

Minicourses and Workshops

2024 Infrared Symmetries of General Relativity

I São Paulo School in Gravitational Physics

Quantum Field Theory in Curved Spacetime
Golden Wedding of Black Holes and Thermodynamics

2021 Algebraic Methods of Theoretical Physics

III Jayme Tiomno School in Theoretical Physics

2020 An Introduction to LaTeX

XV Oceanography Thematic Week

Oceanographic Institute, University of São Paulo

2019 An Introduction to Large

I Jayme Tiomno School in Theoretical Physics

Teaching Experience (continued)

Teaching Assistant

2024 Electromagnetic Phenomena

Federal University of ABC, SP, Brazil

Undergraduate-level course covering introductory electrodynamics

Hosted weekly office hours

2021 Classical Mechanics II

Federal University of ABC, SP, Brazil

Undergraduate-level course covering analytical mechanics

Hosted weekly office hours

2019 Classical Mechanics II

Institute of Physics, University of São Paulo, SP, Brazil

Undergraduate-level course covering introductory Fourier analysis

Hosted office hours twice a week

Miscellaneous

2023 – Ongoing 📕 gravitonick

https://www.youtube.com/@gravitonick

YouTube channel discussing advanced physics topics aimed at undergraduate students

2018 – Ongoing Physics Stack Exchange

Active contributor to the Physics Stack Exchange Q&A website

Most prolific contributor to the qft-in-curved-spacetime tag

2018 – 2020 Informal office hours

Hosted "informal office hours" twice a week for first-year students at IFUSP

Research Presentations

Contributed Talks

2024 Positive mass in general relativity without energy conditions

• XLVII Paulo Leal Ferreira Congress (São Paulo State University, São Paulo, Brazil)

Nonperturbative renormalization group flow for a particle detector

• Golden Wedding of Black Holes and Thermodynamics (online conference)

Poster Presentations

Negative masses are unstable and we don't need energy conditions to prove it

• Witnessing Quantum Aspects of Gravity in a Lab (Principia Institute, São Paulo, Sep. 23–27, 2024)

2023 Nonperturbative aspects of quantum field theory in curved spacetime

- Interfaces Between Quantum and Classical Statistical Mechanics (University of São Paulo's Institute of Mathematics and Statistics, Jul. 24–28 2023)
- V Jayme Tiomno Physics School (University of São Paulo's Institute of Physics, Sep. 4–8, 2023)
- XLVI Paulo Leal Ferreira Congress (São Paulo State University's Institute of Theoretical Physics, Oct. 24–27, 2023)

Research Presentations (continued)

Flash Talks

2023 - 2024

- Nonperturbative renormalization group flow for a particle detector
 - School on Phase Transitions and Gravitational Waves (Federal University of Rio Grande do Norte's International Institute of Physics, Mar. 4–8, 2024)
 - Quantum Spacetime and the Renormalization Group 2023 (Sant'Elmo Beach Hotel, Oct. 2–6, 2023)

Miscellaneous

Languages

Portuguese (native speaker), English (fluent), Italian (basic)

Digital Skills

KTEX, Mathematica, HTML, Python, C, ...