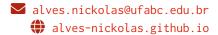
Níckolas de Aguiar Alves 💿

PhD candidate in physics
Federal University of ABC
Santo André, São Paulo, Brazil



Education

2023- **Doctor in Physics**

Federal University of ABC (UFABC), Santo André, São Paulo, Brazil

Advisor: André G. S. Landulfo @

2021–2023 Master in Physics

Federal University of ABC (UFABC), Santo André, São Paulo, Brazil

Advisor: 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 (IFUSP), São Paulo, São Paulo, Brazil

Advisor: João C. A. Barata @

Academic Publications

Papers and Preprints

- N. Aguiar Alves and A. G. S. Landulfo. "Null infinity as a Killing horizon". *Physical Review D* 112, 065017 (2025). arXiv: 2504.12514 [gr-qc].
- N. Aguiar Alves, A. G. S. Landulfo, and B. A. Costa. "Positive mass in general relativity without energy conditions". *Physical Review D* 111, 044027 (2025). arXiv: 2408.00154 [gr-qc].

Other Works

- **N. Aguiar Alves**. Lectures on the Bondi–Metzner–Sachs group and related topics in infrared physics. 2025. arXiv: 2504.12521 [gr-qc]. Submitted.
- N. Aguiar Alves and B. A. Costa. *The Measure of a Mass*. Essay written for the Gravity Research Foundation 2025 Awards for Essays on Gravitation. 2025. arXiv: 2503.18963 [gr-qc].
- N. 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].

To Appear

N. Aguiar Alves, C. C. Rodrigues, and G. J. Olmo. *Platypus stars: Exotic compact objects supported by vacuum pressure.* In preparation.

Funding

2025– PhD Scholarship

São Paulo Research Foundation (FAPESP) Grant No. 2025/05161-0

Project: The Sky as a Killing Horizon and Other Topics on the Infrared Structure of Gravity

Advisor: André G. S. Landulfo (1)

2023–2025 PhD Scholarship

Coordenação de Aperfeiçoamento do Pessoal de Ensino Superior (CAPES)

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

Funding (continued)

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 Space-

times

Advisor: André G. S. Landulfo @

2021 MSc Scholarship

Coordenação de Aperfeiçoamento do Pessoal de Ensino Superior (CAPES)

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

2019–2020 RSc Scholarship

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

Project: Hyperbolic Equations Advisor: João C. A. Barata ¹⁰

Academic Service

Conferences Organized

2026 (scheduled) Thermality in Quantum Field Theory in Curved Spacetimes

Main organizer

Supported by the ICTP South American Institute for Fundamental Research

Golden Wedding of Black Holes and Thermodynamics

Main organizer

Schools Organized

2025 II São Paulo School in Gravitational Physics

Main organizer

Part of ICTP Physics Without Frontiers

I São Paulo School in Gravitational Physics

Main organizer

2018–2021 Jayme Tiomno School in Theoretical Physics

Founder and organizer of the first three editions

Scientific Societies

2025- Brazilian Physical Society

2024 International Society for Quantum Gravity

Teaching Experience

Minicourses and Workshops

2025 Introduction to Black Hole Physics

II São Paulo School in Gravitational Physics

Minicourse for early undergraduate students

2024 Infrared Symmetries of General Relativity

I São Paulo School in Gravitational Physics

Minicourse for advanced undergraduate and early graduate students

2023 Quantum Field Theory in Curved Spacetime

Golden Wedding of Black Holes and Thermodynamics

Minicourse for early graduate students

Teaching Experience (continued)

Algebraic Methods of Theoretical Physics 2021

III Jayme Tiomno School in Theoretical Physics

Minicourse on group theory in physics for first-year undergraduate students

An Introduction to LATEX 2020

XV Oceanography Thematic Week

Oceanographic Institute, University of São Paulo

An Introduction to LaTeX 2019

I Jayme Tiomno School in Theoretical Physics

Teaching Assistant

Topics in Celestial Holography 2025

Institute of Physics, University of São Paulo

Graduate-level course

Advanced Topics in General Relativity

Institute of Physics, University of São Paulo

Graduate-level course

Electromagnetic Phenomena 2024

Federal University of ABC

Undergraduate-level course covering introductory electrodynamics

Classical Mechanics II 2021

Federal University of ABC

Undergraduate-level course covering analytical mechanics

Mathematical Physics I 2019

Institute of Physics, University of São Paulo

Undergraduate-level course covering introductory Fourier analysis

Outreach and Miscellanea

■ International Young Physicists Tournament (Brazil) 2025

Juror for the final stage of the 2025 edition of the IYPT Brazil

■ VICTP-SAIFR Summer School for Young Physicists

Tutored a course on black hole physics for high school students

gravitonick 2023-

YouTube channel discussing advanced physics topics aimed at undergraduate students

Physics Stack Exchange 2018-

Active contributor to the Physics Stack Exchange Q&A website

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