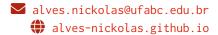
# Níckolas de Aguiar Alves 💿

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

- 1 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. 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 💿

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 <sup>10</sup>

## **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

III Jayme Tiomno School in Theoretical Physics

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

An Introduction to LaTeX

XV Oceanography Thematic Week

Oceanographic Institute, University of São Paulo

An Introduction to LaTeX

I Jayme Tiomno School in Theoretical Physics

#### **Teaching Assistant**

Topics in Celestial Holography
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
Federal University of ABC
Undergraduate-level course covering introductory electrodynamics

Classical Mechanics II
Federal University of ABC
Undergraduate-level course covering analytical mechanics

Mathematical Physics I
Institute of Physics, University of São Paulo
Undergraduate-level course covering introductory Fourier analysis

#### Outreach and Miscellanea

International Young Physicists Tournament (Brazil)

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

2018- Physics Stack Exchange
Active contributor to the Physics Stack Exchange Q&A website
Most prolific contributor to the qft-in-curved-spacetime tag