

Personal info

Pronouns : he / him

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📍 Madrid, Spain

🌐 adierckx.github.io

Technical skills

○ Python

○ Wolfram Mathematica

○ ROOT

○ L^AT_EX

Languages

🇫🇷 French (fluent)

🇬🇧 English (fluent)

Antoine Dierckx

PhD Candidate in Theoretical Physics at CSIC/IFT-UAM.

Developing a computational framework to bridge **Spinfoam amplitudes** and effective **Loop Quantum Cosmology**. My work focuses on extracting observational predictions for the Early Universe (bounce dynamics, PBH phenomenology) using high-performance numerical tools.

Research interests

- Spinfoam cosmology & numerical evaluation of amplitudes
- Primordial Black Holes: formation, relics, and evaporation
- Quantum-geometric signatures in CMB and GW backgrounds

Education

PhD in Theoretical Physics

CSIC / IFT - Universidad Autónoma de Madrid, ES Dec 2025 – Present
Advisor: Dr. Francesca Vidotto | Tutor: Prof. Juan García-Bellido

Master in Physics

Université libre de Bruxelles, BE Sep 2023 – Jun 2025
Graduated *magna cum laude* (High Distinction)

Bachelor in Physics

Université libre de Bruxelles, BE Sep 2020 – Jun 2023
Graduated *cum laude* (Distinction)

Research Experience

Visiting Graduate Researcher (Master's Thesis)

Western University (CA) & ULB (BE) Sep 2024 – Jun 2025

- Studied PBH phenomenology in Loop Quantum Gravity under F. Vidotto and S. Clesse.
- Modeled PBH remnants and evaporation, deriving observational constraints.
- Combined analytical modeling with scientific computing (Python/Mathematica).

CERN Summer Student

Compact Muon Solenoid (CMS), Geneva, CH Jul 2024 – Aug 2024
Developed Graph Neural Networks for VBF tagging; analyzed algorithm stability for the $H \rightarrow$ invisible channel.

Research Intern

Interuniversity Institute for High Energies (IIHE), BE Jan 2023 – Apr 2023
Analysis of scalar-boson production in pp collisions (CMS data, $\sqrt{s} = 13$ TeV).

Advanced Training & Schools

Blaumann's School on Loop Quantum Gravity

Les Houches School of Physics, FR Sep 2025

CERN Summer Student Lecture Programme

Geneva, CH Jul 2024