Ana Isabel Costa Pereira

Personal details

Name: Ana Isabel Costa Pereira
Date of birth: 26/06/1998
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Education

University of Liverpool — Liverpool
PhD in Mathematical Sciences - Theoretical Physics — *2023 – 2027*

University of Coimbra — Coimbra
Master in Nuclear and Particle Physics, Thesis — *2019 – 2021*

University of Coimbra — Coimbra
Bachelors in Physics — *2016 – 2019*

Research Experience

Research Scholarship in project CERN/FIS-COM/0035/2019, Toolkit for precision calculations in the SM and beyond, composite Higgs model and hadronic parity violation 07/2022–12/2022

- **Hadronic Physics and Fundamental Interactions research group of CFisUC**
- Computation of the decay rate for Higgs $\longrightarrow$ gluon quark-antiquark in IReg to verify the KLN theorem
- Computation of the cross section for $e^+e^- \longrightarrow \gamma* \longrightarrow q\bar{q}$ with massive quarks using IReg method to complement the NLO result published previously for non massive quarks and study how to parameterize divergences in the massive case

Research Scholarship in project CERN/FIS-PAR/0040/2019, Tools for precision calculations in the Standard Model and beyond 12/2020 – 03/2022

- **Hadronic Physics and Fundamental Interactions research group of CFisUC**
- Study of the compatibility between the Kinoshita–Lee–Nauenberg theorem and Implicit Regularization scheme using an effective field theory to describe the decay of the Higgs boson into gluons

Research Scholarship in project UID/FIS/04564/2019, 'Celular Migration' 09/2019 – 09/2020

- **Soft and Biological Matter research group of CFisUC**
- Computational implementation of a mathematical model of angiogenesis to describe the vascular growth in system of tumorous cells in the presence of inhibiting agents in nanoparticles
- Computational implementation (Python) of mathematical model to describe axonial growth dependence of mRNA internal transport

Tutorial experience

Physics Tutor in LxMath 2021–2022

- Tutoring in Physics and Chemistry

Physics Tutor in Academia da Ines 2021–2022

- Tutoring in Physics and Chemistry

Oral presentations

Invited talk in workshop 'Excited QCD', Italy 2022

- Talk on 'Higgs boson decay into gluons: IR cancellation in the decay rate at NLO using Implicit Regularization'

Seminar at Journal Club in Department of Physics, University Coimbra 2022

- Talk on 'Higgs boson decay into gluons: IR cancellation in the decay rate at NLO using Implicit Regularization'

Seminar II, Physics Department (University of Coimbra) 2021

- Talk on 'Effective Field Theory Amplitudes the On-Shell Way: Scalar Couplings to Gluons'

Seminar I, Physics Department (University of Coimbra) 2021

- Talk on 'An introduction to Effective Field Theories'

Projects

Research scholarship in project CERN/FIS-COM/0035/2019 2022-2022
Research scholarship in project CERN/FIS-PAR/0040/2019 2021-2022
Research scholarship in project UID/FIS/04564/2019 2019-2020
Project 'Viver Astronomia' 2022-2023
- Astronomical observations and science communication

Colaborator of the blog Uniarea 2020-2022
Participation in the European BEST Engineering Competition Challenge in category 'Case Study' 2018
- 24 hour challenge to propose application on earth of space technology

Participation in the National Final of Astronomy Olympics 2016
Participation in the regional stage of Astronomy Olympics 2016
Participation in 'FCT NOVA Challenge' with the project 'SN2016adj - A supernova destiny' 2016

Distinctions

Recognition of the International Astronomical Search Collaboration 2016
- Contributions to observations of near-Earth objects and main belt asteroids discoveries by participation on analysis of images from 'Pan-STARRS'

Recognition in contest 'Beamline for schools' of CERN for the proposal 'Bragg Peak' 2015

Memberships

Sociedade Portuguesa de Física 2022-2023

Meetings, Schools and Conferences

International Conference 'Excited QCD', Italy, (https://indi.to/RrRMk) 2022
- Talk on 'Higgs boson decay into gluons: IR cancellation in the decay rate at NLO using Implicit Regularization'

'Course on Physics at the LHC', LIP 2021
'Summer school in computational biology', University of Coimbra 2019
'International Masterclasses - Hands on Particles', University of Aveiro 2015, 2016
Course Life and Death of Stars, Astronomical Observatory of Lisbon 2015
Advanced Course in Microbiology, Instituto de Educação e Cidadania 2014
Advanced Course in Celular and Molecular Biology, Instituto de Educação e Cidadania 2013

Publications

Higgs boson decay into gluons in a 4D regularization: IR cancellation without evanescent fields to NLO, Ana Pereira, Adriano Cherchiglia, Marcos Sampaio, Brigitte Hiller, *Acta Physica Polonica B*, vol. 16, article 8-A15, 2023

Higgs boson decay into gluons in a 4D regularization: IR cancellation without evanescent fields to NLO, Ana Pereira, Adriano Cherchiglia, Marcos Sampaio, Brigitte Hiller, *European Physical Journal C*, 83, 2023

Intratumoral VEGF nanotrapper reduces gliobastoma vascularization and tumor cell mass, F. Sousa, A. Pereira, A. Cruz, F. Ferreira, M. Gouveia, J. Bessa, B.Sarmento, R. Travasso, I. Pinto, *Journal of Controlled Release, vol 339, pages 281-390, 2021*

Technical Skills

Operating systems: Windows, Mac OS
Programming: Python, Mathematica, FeynArts, FeynCalc, Package-X
Text-Editing: Microsoft word, LaTeX
Data-Analysis: Microsoft Excel

Language Skills

Moder Tongue: Portuguese
Proficient user: English