Amedeo Chiefa

Postgraduate Student

The Higgs Centre for Theoretical Physics, University of Edinburgh

JCMB, KB, Mayfield Rd - Edinburgh EH9 3JZ, Scotland

amedeo.chiefa@ed.ac.uk | LinkedIn Profile | GitHub |

Summary

I am a Ph.D. candidate in Theoretical Particle Physics at the University of Edinburgh. My research focuses on the phenomenological aspects of particle interactions, with a particular interest in quantum chromodynamics. My work combines theoretical models of fundamental interactions with high-energy experimental data to uncover the internal structure of the proton in terms of quarks and gluons. I am actively involved in the development of computational tools required tu pursue my research goals. These tools leverage machine learning and artificial intelligence techniques, and I have a keen interest in the theoretical foundations of deep learning. Proficient in coding, I actively pursue personal coding projects to enhance my technical skills.

Education

Ph.D in Theoretical Physics   11/2023 – expected 10/2027
Specialisation field: Theoretical Particle Physics
The University of Edinburgh (UK) — Supervisor: Prof. Luigi Del Debbio

M.Sc. in Theoretical Physics (110/110 cum laude)   24/10/2023
LM-17 — Classe delle lauree magistrali in Fisica, D.M. 270/04
University of Turin — Supervisor: Prof. Emanuele R. Nocera
Thesis title: Towards Polarised Parton Distribution Functions at next-to-next-to-leading order

B.Sc. in Physics (109/110)   20/07/2021
L-30 — Classe delle lauree in scienze e tecnologie fisiche, D.M. 270/04
University of Turin — Supervisor: Prof. Marco Regis
Thesis title: Self-interacting dark matter: cross-section calculation

Publications

Parton distributions confront LHC Run II data: a quantitative appraisal
A. Chiefa, M. N. Costantini, J. Cruz-Martinez, E. R. Nocera, T. R. Rabemananjara, J. Rojo, T. Sharma, R. Stegeman, M. Ubiali
Published in: JHEP 07 (2025) 067 | e-Print: arXiv:2501.10359

Status and Developments in Polarised Parton Distribution Functions
A. Chiefa
PoS DIS2024 (2025) 200

Helicity-dependent parton distribution functions at next-to-next-to-leading order accuracy from inclusive and semi-inclusive deep-inelastic scattering data
V. Bertone, A. Chiefa, E. R. Nocera
Published in: *Phys.Lett.B* 865 (2025) 139497 | e-Print: arXiv:2404.04712v1

Participation in Conferences and Workshops

31st International Workshop on Deep Inelastic Scattering (DIS2024)   08/04/2024 – 12/04/2024
Talk title: Towards helicity-dependent parton distribution functions at NNLO accuracy

Funding and Programmes for the research activity

Participation in Erasmus+ Traineeship CALL 2022   01/03/2023 – 31/05/2023
CEA Paris-Saclay, IRFU (FR) – Supervisor: Dott. Valerio Bertone

I participated in the CALL 2022 of the Erasmus+ Traineeship funded by the European Commission. The activity focused on the determination of the polarised parton distribution functions of the proton at NNLO within the MAP framework.

Participation in International Collaborations

NNPDF Collaboration
Junior member since November 2023. The NNPDF Collaboration performs phenomenological studies in the field of Quantum Chromodynamics, and determines the so-called parton distribution functions of the proton. I contribute actively to the maintenance and development of the NNPDF codebase. Currently, I am also involved in two side projects, one of which has resulted in a publication.

MAP Collaboration
Member since March 2023. The MAP collaboration performs phenomenological analyses to extract the multidimensional distribution of partons inside hadrons. The main focus of the collaboration is the determination of Transverse Momentum Distributions, Generalized Parton Distributions, and Fragmentation Functions. With other three members of the collaboration, I developed the first codebase to extend the analysis to polarised parton distribution functions. I am currently working on the extension of the codebase to achieve higher order accuracy in the theoretical predictions.

Teaching activity

Tutor in Principles of Quantum Mechanics, 2024/2025 academic year, first semester
3rd year undergraduate students, School of Physics and Astronomy, University of Edinburgh (UK)

Tutor in Computer Simulation, 2023/2024 academic year, second semester
2nd year undergraduate students, School of Physics and Astronomy, University of Edinburgh (UK)

Technical skills

Programming Languages: Python, C++, bash, Fortran

Software: Mathematica, MATLAB, LaTeX, Git

Language skills

Mother tongue: **Italian**

Other languages: **English** (C1), **French** (Basic)

Certifications:
English: IELTS Academic (7.5/9.0)