Niccolò **Laurenti**

Researcher in Particle Physics · Scientific Software Developer

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Personal Informations

Birth 1997, Rome, Italy
Citizenship Italian
Languages Italian (native language), English (fluent)

Education

Ph.D. in Physics

Milan, Italy

University of Milan

Oct. 2021 - current

- Field of study: Theoretical Particle Physics, Computational Physics.
- Graduating in fall 2024.

M.S. in Physics

Rome, Italy

University of Rome "La Sapienza"

Sep. 2019 - Oct. 2021

- Field of study: Theoretical Particle Physics.
- Grade: 110/110 (cum laude).
- Thesis: *Construction of a next-to-next-to-next-to-leading order approximation for heavy flavour production in deep inelastic scattering with quark masses*.

B.S. in Physics

Rome, Italy

University of Rome "La Sapienza"

Sep. 2016 - Nov. 2019

- Grade: 110/110 (cum laude).
- Thesis: *Particle identification with the time of flight method and applications to the CMS experiment*.

Skills

Programming C, C++, Python, Fortran, Bash, Git
Scientific packages GSL, Numpy, Scipy, Matplotlib, Pandas, Keras, Tensorflow, SQLite
Scientific programs Matlab, Mathematica
Writing Latex, Microsoft Office

Experience

Ph.D. Researcher

Milan, Italy

Researcher in Theoretical Particle Physics at the University of Milan and INFN

Oct. 2021 - current

- During my Ph.D., I worked under the supervision of Prof. Stefano Forte in the NNPDF collaboration as a developer of the NNPDF code. My role involved developing techniques and computational programs applied to particle physics. The aim of the research project was to utilize artificial intelligence to investigate, with high precision, the internal structure of the proton analyzing experimental data collected at CERN.
- The results of the work have been published in three papers and have been presented in conferences.
- Furthermore, during this period, I worked as a Teaching Assistant and Lecturer for both Bachelor's and Master's courses and I co-supervised Bachelor and Master theses.

Undergraduate Researcher

Rome, Italy

Researcher in Theoretical Particle Physics at the University of Rome "La Sapienza"

Mar. 2021 - Oct. 2021

- During my Master Thesis I worked, under the supervision of Dr. Marco Bonvini and in collaboration with another Master student, to develop theoretical methods and computational programs to produce high-precision theoretical predictions in particle physics. These predictions aimed to describe experimental data collected at the particle accelerator HERA.
- As a result of the work, two programs have been written, `Adani` and `DIS_TP`, a paper has been published and the results have been presented in conferences.

Publications

2024 **Implementation of DIS at N^{3}LO for PDF determination**, A. Barontini, M. Bonvini, N. Laurenti

2024 **The Path to N^{3}LO Parton Distributions**, The NNPDF Collaboration, R. D. Ball et al.

2024 **Determinantion of the theory uncertainties from missing higher orders on NNLO parton distributions with percent accuracy**, The NNPDF Collaboration, R. D. Ball et al., *Eur. Phys. J. C*

2024 **Photons in the proton: implications for the LHC**, The NNPDF Collaboration, R. D. Ball et al., *Eur. Phys. J. C*

2023 **Inclusion of QED corrections in PDFs fits**, N. Laurenti, *Nuclear and Particle Physics Proceedings*

2022 **Approximating missing higher-orders in transverse momentum distributions using resummations**, N. Laurenti, T. R. Rabemananjara, and R. Stegeman, *Contribution to DIS2022*

Talks

2023 **Evidence of intrinsic charm quarks in the proton**, Mainz, Germany *MENU23*

2023 **Including QED corrections in PDF fits: The NNPDF4.0QED PDF set**, Durham, UK *QCD@LHC23*

2023 **Inclusion of QED corrections in PDFs: The NNPDF4.0QED PDF set**, Montpellier, France *QCD23*

2021 **Construction of a third order approximation for heavy flavour production in deep inelastic scattering**, Milan, Italy *MCM 2021*

Teaching activity

2024 **TA for the course of Quantum Physics I**, Introduction to Quantum Mechanics *University of Milan*

2024 **TA for the course of Quantum Physics II**, Advanced course on Quantum Mechanics *University of Milan*

2023 **TA for the course of Theoretical Physics I**, Introduction to Quantum Field Theory *University of Milan*

2023 **TA for the course of Physics**, Basics of Classical Mechanics and Thermodynamics *University of Milan*

2023 **TA for the course of Quantum Physics II**, Advanced course on Quantum Mechanics *University of Milan*

2023 **Exercise classes for the course of Quantum Physics II**, Advanced course on Quantum Mechanics *University of Milan*

2022 **TA for the course of Quantum Physics I**, Introduction to Quantum Mechanics *University of Milan*