

# Davide Maria Tagliabue

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## Personal Information

Date of birth June 8th, 1996  
Place of birth Milan, Italy  
Citizenship Italian  
Languages Italian (mother tongue), English (C1 level)

## Current position

2024-ongoing **Postdoc**, *Karlsruhe Institute of Technology (TTP)*, Karlsruhe, Germany.  
Supervisor Prof. Dr. Kirill Melnikov

## Education

2021-2024 **Ph.D.**, *Università degli Studi di Milano - Statale*, Milan, Italy.  
Supervisor Prof. Dr. Raoul Röntsch  
Co-supervisor Dr. Chiara Signorile-Signorile  
Short description My Ph.D. studies focus on perturbative quantum chromodynamics (QCD), and in particular on the treatment of infrared singularities. I also have some familiarity with Standard Model Effective Field Theory and loop amplitudes.

2018-2021 **M.Sc.**, *Università degli Studi di Milano - Statale*, Milan, Italy.  
Title *Threshold resummation of rapidity distributions in SCET vs. direct QCD*  
Advisor Prof. Dr. Stefano Forte  
Co-advisor Prof. Dr. Giancarlo Ferrera  
Grade 110/110 cum laude  
Short description In the context of threshold resummation theory, a recent study proposed a general result reached through an effective theory approach known as SCET. The goal of my master thesis is to build a bridge between this approach and the standard formalism of QCD. I also conducted an analytical comparison with previous results known in the literature.

2015-2018 **B.Sc.**, *Università degli Studi di Milano - Statale*, Milan, Italy.  
Title *Statistical mechanics of error-correcting codes: heuristic analysis of Surlas codes with finite connectivity* (original title in Italian)  
Advisor Prof. Dr. Sergio Caracciolo  
Co-advisor Dr. Pietro Rotondo  
Grade 110/110 cum laude

Short description In my bachelor thesis I dealt with the theory of error-correcting codes. Specifically, I studied a particular class of correcting codes, known as *Sourlas codes*, and wrote a C++ program that simulated its performance. I then proposed a comparison between the performance of the Sourlas codes and that of other correcting codes known in the literature.

## Students supervision experience

01/2023 - ongoing **M.Sc. co-supervisor**, *Student: Matteo Tresoldi*, Università degli Studi di Milano - Statale, Milan.  
Thesis title *QCD NNLO corrections of the process  $e^+e^- \rightarrow 3 \text{ jets}$  computed through the nested soft-collinear subtraction scheme*

## Teaching experience

2023/2024 **Teaching assistant**, *Quantum Field Theory 1*, Master's Degree in Physics, Università degli Studi di Milano - Statale.  
Lecturers: Prof. Dr. Raoul Röntsch  
2023/2024 **Teaching assistant**, *Physics and Informatics*, Bachelor's Degree in Pharmaceutical Sciences, Università degli Studi di Milano - Statale.  
Lecturers: Prof. Dr. Giovanni Pietro Rosotti, Prof. Dr. Lidia Dell'Asta  
2023/2024 **Teaching assistant**, *Quantum Mechanics 2*, Bachelor's Degree in Physics, Università degli Studi di Milano - Statale.  
Lecturers: Prof. Dr. Giancarlo Ferrera, Prof. Dr. Marco Zaro

## Other responsibilities

09/2023 - ongoing **Organizer of the HEP group seminars**, *Università degli Studi di Milano - Statale*, Milan, Italy.  
10/2021 - ongoing **PhD Students Representative in the Physics Department Council**, *Università degli Studi di Milano - Statale*, Milan, Italy.

## Outreach

06/2020 - ongoing **Guidance for high school students**, *Istituto Salesiano Sant'Ambrogio*, Milan, Italy.  
I am involved in providing guidance to high school students for their university path, illustrating the opportunities that physics can unlock for their future.

## Research Visits

20-25 May 2024 **Max Planck Institut für Physik**, *Munich*, Germania.  
Collaboration with Dr. Chiara Signorile-Signorile and her group.  
22-29 Oct. 2023 **University of Oxford**, *Oxford*, UK.  
I was guest of Prof. Dr. Fabrizio Caola. I presented my studies to his research group and other members of the Physics Department at Oxford.  
15-21 Jan. 2023 **KIT**, *Karlsruhe*, Germany.  
Collaboration with Prof. Dr. Kirill Melnikov and his group.  
10-19 Oct. 2022 **KIT**, *Karlsruhe*, Germany.  
Collaboration with Prof. Dr. Kirill Melnikov and his group.

## Conferences and Workshops

03/2024 **ACAT 2024**, *Stony Brook*, New York, USA.

- 12/2023 **Christmas Meeting 2023**, Milan, Italy.
- 09/2023 **QCD@LHC 2023**, Durham, UK.
- 08/2023 **EPS-HEP 2023**, Hamburg, Germany.
- 11/2023 **Precision calculations for Drell-Yan processes**, Milan, Italy.
- 12/2022 **Christmas Meeting 2022**, Milan, Italy.
- 12/2021 **Christmas Meeting 2021**, Milan, Italy.

## Schools

- 17 - 21 June 2024 **Amplitudes 2024 School**, *Institute for Advanced Study*, Princeton, NJ, Germany.  
Theory lectures, tutorial and exercise sessions;
  - *S-matrix Bootstrap* (Lucía Córdova),
  - *Amplitudes and Observables* (Donal O'Connell),
  - *Causality and inclusive amplitudes* (Simon Caron-Huot),
  - *Amplitudes for Phenomenology* (Fabrizio Caola),
  - *Scattering Amplitudes and Effective Field Theory* (Henriette Elvang),
  - *The tropical and discrete geometry of Feynman integrals* (Michael Borinsky).
- 28 Aug - 9 Sept 2022 **28th "Saalburg" Summer School**, Bayrischzell, Germany.  
Theory lectures, tutorial and exercise sessions;
  - *Spontaneous symmetry breaking and Nambu-Goldstone bosons* (Tomas Brauner),
  - *Conformal field theory* (Stefan Fredenhagen),
  - *Phase transitions in the early universe* (Marieke Postma),
  - *String-inspired methods and the worldline formalism* (Christian Schubert),
  - *Modern methods for scattering amplitudes* (Lorenzo Tancredi).
- 10/2021 - ongoing **Unimi Ph.D. School**, Milan, Italy.  
Theory lectures, tutorials and exams;
  - *Cosmology*,
  - *Observations and theory of large-scale structure formation*,
  - *Neutrino physics*,
  - *Computational, simulation and machine learning methods in high energy physics and beyond: automated computational tools*,
  - *Computational, simulation and machine learning methods in high energy physics and beyond: Monte Carlo methods*.

## Seminars

- 19/12/2024 Talk at the **Christmas Meeting 2024 workshop**, "*New Frontiers of the Nested Soft-Collinear Subtraction Scheme*", Milan, Italy.
- 27/10/2023 Invited talk at the **Polytechnic University of Milan**, "*The Universe at the Infinitely Small Scale: The Standard Model*", Milan, Italy.
- 13/03/2024 Talk at the **ACAT 2024 conference**, "*A fresh look at the Nested Soft-Collinear subtraction scheme: NNLO QCD corrections to  $N$ -gluon final state  $q\bar{q}$  annihilation*", Stony Brook, New York (USA).
- 21/12/2023 Talk at the **Christmas Meeting 2023 workshop**, "*A fresh look at the Nested Soft-Collinear subtraction scheme: NNLO QCD corrections to  $N$ -gluon final state  $q\bar{q}$  annihilation*", Milan, Italy.
- 27/10/2023 Invited talk at the **University of Oxford**, "*A fresh look at the Nested Soft-Collinear subtraction scheme: NNLO QCD corrections to  $N$ -gluon final state  $q\bar{q}$  annihilation*", Oxford, UK.

- 04/09/2023 Talk at the **QCD@LHC 2023 conference**, “*Generalization of the Nested Soft-Collinear subtraction method for NNLO QCD calculation*”, Durham, UK.
- 22/08/2023 Talk at the **EPS-HEP 2023 conference**, “*Towards a general Nested Soft-Collinear subtraction method for NNLO calculations*”, Hamburg, Germany.
- 22/12/2021 Talk at the **Christmas Meeting 2021 workshop**, “*Threshold resummation of rapidity distributions: a translation of the state of the art from SCET to dQCD*”, Milan, Italy.

## List of publications

- 2025 ***Towards a general subtraction formula for NNLO QCD corrections to processes at hadron colliders: final states with quarks and gluons***, arXiv:2503.15251.  
F. Devoto, K. Melnikov, R. Röntsch, C. Signorile-Signorile, [D.M. Tagliabue](#), M. Tresoldi
- 2025 ***WH production at the LHC within SMEFT at next-to-next-to-leading order QCD***, arXiv:2502.12846.  
M. Bonetti, R.V. Harlander, K. Melnikov, D. Korneev, M.M. Long, R. Röntsch, [D.M. Tagliabue](#)
- 2024 ***A fresh look at the nested soft-collinear subtraction scheme: NNLO QCD corrections to  $N$ -gluon final states in  $q\bar{q}$  annihilation***, arXiv:2310.17598, [JHEP 02 (2024) 016].  
F. Devoto, K. Melnikov, R. Röntsch, C. Signorile-Signorile, [D.M. Tagliabue](#)

## List of proceedings

- 2023 ***Toward a general nested soft-collinear subtraction method for NNLO calculations***, [PoS(EPS-HEP2023)].  
C. Signorile-Signorile, [D.M. Tagliabue](#)
- 2023 ***Advances in the nested soft-collinear subtraction scheme***, arXiv:2308.11982v1, [PoS(RADCOR2023)075].  
C. Signorile-Signorile, [D.M. Tagliabue](#)

## Computer skills

- Programming languages C++, Fortran, Mathematica, Form
- Writing Office package,  $\text{\LaTeX}$