Davide Maria Tagliabue

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*, Karlsruhe, Germany.
Supervisor	Prof. Dr. Kirill Melnikov
Short description	My research focuses on perturbative quantum chromodynamics (QCD), and in particular on the treatment of infrared singularities.

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 Sourlas codes with finite connectivity* (original title in Italian)
Advisior	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 $e^+e^- \to 3$ 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 **Amplitudes 2024 School**, *Institute for Advanced Study*, Princeton, NJ, Germany.
2024 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 **28th "Saalburg" Summer School**, *Bayrischzell*, Germany.
Sept 2022 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 - **Unimi Ph.D. School**, *Milan*, Italy.
ongoing 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

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

2024 ***A fresh look at the nested soft-collinear subtraction scheme: NNLO QCD corrections to N-gluon final states in $q\bar{q}$ annihilation***, [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, LaTeX