



# Davide Morgante

## Personal Information

Date of birth February 22nd, 1996  
Place of birth Rome, Italy  
Citizenship Italian

## Education

2021-2024 **Ph.D.**, *University of Milan*, Milan, Italy

Supervisor Dr. Antonio Amariti

Short description My Ph.D focuses on formal aspects of (Supersymmetric-)Quantum Field Theories, Holography and String/M-theory. Recently I've been interested in generalized and non-invertible symmetries, as well as more mathematical aspects of topological QFTs.

2019-2021 **M.Sc.**, *Sapienza University of Rome*, Rome, Italy

Title Unitarity triangle analysis and recent theoretical advancements on  $\epsilon'/\epsilon$

Advisor Prof. Guido Martinelli

Co-advisor Prof. Marco Nardecchia

Grade 110/110 cum laude

Short description In my master thesis I worked on the UT analysis of the  $\epsilon'/\epsilon$  parameter in the  $K \rightarrow 2\pi$  decay starting from the recent result from R.Abbott et al. (arXiv:2004.09440v2). The work of my thesis resulted in the publication of a related paper in the "Rendiconti Lincei" journal.

2016-2019 **B.Sc.**, *Sapienza University of Rome*, Rome, Italy

Title Semiclassical transition amplitudes. (original: Ampiezze semiclassiche di transizione.)

Advisor Prof. Guido Martinelli

Grade 110/110 cum laude

Short description In my bachelor thesis I analyzed the transition probability of a metastable state for a generic scalar field theory, in the semiclassical limit. In the thesis I also gave the theoretical basis upon which the transition probability was calculated, namely: Feynman path integral formulation, quantum tunneling and classical field theory arising from the collective excitation of a system with many degrees of freedom.

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## Teaching experience

- Sept 2023 **Teaching**, *Introductory math*, University of Milan, Milan.  
Lecturer: Davide Morgante
- Feb-Sept 2023 **Teaching Assistant**, *Mathematical methods for Physics*, University of Milan, Milan.  
Lecturers: Prof. Luca Guido Arthur Molinari, Prof. Rontsch Raoul Horst
- Sept 2022 **Teaching**, *Introductory math*, University of Milan, Milan.  
Lecturer: Davide Morgante
- Feb-Sept 2022 **Teaching Assistant**, *Mathematical methods for Physics*, University of Milan, Milan.  
Lecturers: Prof. Luca Guido Arthur Molinari, Prof. Alessio Zaccane, Prof. Rontsch Raoul Horst

## Visiting

- 1 May - 15 June 2023 **Visiting PhD**, *SISSA*, Trieste.  
I was a visiting PhD student at the International School for Advanced Studies.

## Conferences and Workshops

- Sept 2023 **New Frontiers in Theoretical Physics**, *Cortona*, Italy
- Jul 2023 **Strings 2023**, *Waterloo*, Canada
- Apr 2023 **Eurostrings 2023**, *Gijon*, Spain
- Jan 2023 **Iberian Strings 2023**, *Murcia*, Spain
- Dec 2022 **XVIII Avogadro meeting on Strings, Supergravity and Gauge Theories**, *Turin*, Italy
- Jun 2022 **Theory of Fundamental Interactions INFN conference**, *Venice*, Italy
- March 2022 **Iberian Strings 2022**, *Gijón*, Spain

## Schools

- 3-9 Sept 2023 **Categorical Symmetries in Quantum Field Theory**, *Les Diablerets*, Switzerland.  
Lectures:
  - *Applied cobordism hypothesis* (David Jordan)
  - *Non-invertible symmetries* (Shu-Heng Shao)
  - *The mathematics of TQFTs and defects* (Constantin Teleman)
  - *Symmetry categories 101* (Michele Del Zotto)
- 16 Nov-26 Dec 2022 **LACES 2022**, *Florence*, Italy.  
Lectures:
  - *CFT approaches to amplitudes* (Agnese Bissi)
  - *Methods and techniques in non-perturbative QFT* (Lorenzo Di Pietro)
  - *Holography and quantum gravity* (Roberto Emparan)
  - *Two-dimensional CFT* (Matthias Gaberdiel)
  - *Aspects of 4d supersymmetric dynamics and geometry* (Shlomo Razamat)
- 21-27 Aug 2022 **CERN Winter School on Supergravity, Strings and Gauge Theory 2022**, *Geneva*, Switzerland.  
Lectures:
  - *Topics in the bootstrap* (Dalimil Mazac)
  - *An introduction to the basics of flux vacua and related swampland conjectures* (Thomas Van Riet)
  - *Spectral theory from gauge and string theory* (Alba Grassi)
  - *Emergence of space and time in holography* (Hong Liu)
  - *Line defects: symmetries, RG flows, and screening* (Zohar Komargodski)
  - *Artificial intelligence for theoretical physics and mathematics* (Fabian Ruehle)

9-13 May **ICTP Spring School on Superstring Theory and Related Topics**, Trieste, Italy.

2022 Lectures:

- *Non-invertible symmetries* (Yifan Wang)
- *Celestial amplitudes* (Laura Donnay)
- *Topological aspects of string theory* (Kevin Costello)
- *Strings in  $AdS_3$*  (Matthias Gaberdiel)

## Seminars

2 Nov 2023 Invited talk at **Technion**, "*Spindly  $M5s$* ", Haifa, Israel.

27 Sept 2023 Talk at the **New Frontiers in Theoretical Physics conference**, "*Sporadic dualities from tensor deconfinement*", Cortona, Italy.

27 Sept 2022 Talk at **Università degli Studi di Milano**, "*Supersymmetric dualities in three-dimensions*", Milan, Italy.

## List of publications

2023 **BBBW on the Spindle**, *ArXiv:2309.11362*, [Submitted to Sci-Post].

A. Amariti, S. Mancani, D. Morgante, N. Petri, A. Segati

2023 **Sporadic dualities from tensor deconfinement**, *ArXiv:2307.14146*, [Submitted to JHEP].

A. Amariti, F. Mantegazza, D. Morgante

2023 **One-form symmetries in  $\mathcal{N} = 3$  S-folds**, *Sci-Post*, [10.21468/SciPostPhys.15.4.132].

A. Amariti, D. Morgante, A. Pasternak, S. Rota, V. Tatitscheff

2022 **Chiral dualities for  $SQCD_3$  with D-type superpotential**, *JHEP*, [10.1007/JHEP02(2023)032].

A. Amariti, D. Morgante

2022 **New UTfit Analysis of the Unitarity Triangle in the Cabibbo-Kobayashi-Maskawa scheme**, *Rend.Lincei Sci.Fis.Nat*, [10.1007/s12210-023-01137-5].

UT-fit collaboration

## Highlights

2020 **Honours Program**, *Sapienza University*, Rome.

The Honours Programme is an advanced course providing additional training to the normal study programme. For this program, I followed an additional course at Tor Vergata University held by prof. Raffaele Savelli on group theory, representation theory of finite and Lie groups.

2020 **Student Collaboration Scholarship**, *Sapienza University*, Rome, SoRT.

I won one of the 39 collaboration scholarships at the Physics department of Sapienza. All informations can be gathered from the official page <https://www.uniroma1.it/en/pagina/student-collaboration-scholarships>

## Languages

Italian Mother tongue

English Overall C2 level

French Overall A2 level

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## Computer skills

Programming languages C, C++, Python, Mathematica

Data analysis R, Gnuplot

Writing Office package,  $\text{\LaTeX}$

Misc Basic knowledge of machine learning

Libraries: ROOT, Geant4, Scikit-learn, TensorFlow

## Signature

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