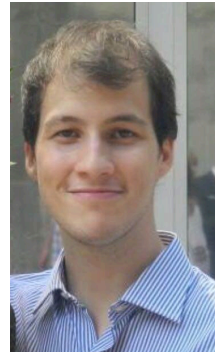


ENRICO MARIA MALATESTA



PERSONAL DATA

PLACE AND DATE OF BIRTH: Rome, Italy | 23 September 1991
PHONE: +39 3462395097
EMAIL: enrico.m.malatesta@gmail.com

RESEARCH INTERESTS

- Machine learning and high dimensional statistics
- Disordered Systems, Spin glasses, Constrained optimization problems, Random matrices and their applications
- Statistical Field Theory

PRESENT POSITION

from 2021 | Assistant Professor, BOCCONI UNIVERSITY.

PREVIOUS POSITIONS

2021-2021 | Academic Fellow, BOCCONI UNIVERSITY.
2019-2021 | Post-Doc, BOCCONI UNIVERSITY, [Artificial Intelligence Lab](#).

EDUCATION

2015-2018 | Phd Student in Theoretical Physics, MILAN UNIVERSITY
Supervisor: Prof. Sergio Caracciolo
External Supervisor: Prof. Giorgio Parisi

2013-2015 | Master Degree in Theoretical Physics, SAPIENZA UNIVERSITÀ DI ROMA
Thesis: Two-Loop Corrections to the Large Perturbative Order of a φ^4 Theory; Supervisors: Prof. Giorgio Parisi and Prof. Tommaso Rizzo

2010-2013 | Bachelor Degree in Physics, SAPIENZA UNIVERSITÀ DI ROMA
Thesis: Feynman's Quantum Statistical Mechanics Formulation;
Supervisor: Dr. Sara Bonella

2005-2010 | Classic High School "L. MANARA", Rome.

AWARDS AND PROJECTS

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|-----------|---|
| 2020 | My PhD thesis has been selected by the evaluation committee of the INFN Fubini prize as worthy of special mention. |
| 2015-2018 | Participant of PRIN (research project of national interest) on "Statistical Mechanics and Complexity". |
| 2013 | Scholarship "Ernesto e Iole de Maggi". |
| 2012-2013 | During my Bachelor, I took part to the Excellence Track ("Percorso di Eccellenza") of the department of physics, Sapienza University of Rome reserved to students with high merits. |

PUBLICATIONS

14. C. Baldassi, C. Lauditi, E. M. Malatesta, R. Pacelli, G. Perugini, R. Zecchina, *Learning through atypical "phase transitions" in overparameterized neural networks*, arXiv:2110.00683.
13. C. Baldassi, C. Lauditi, E. M. Malatesta, G. Perugini, R. Zecchina, *Unveiling the structure of wide flat minima in neural networks*, arXiv:2107.01163.
12. C. Baldassi, E. M. Malatesta, M. Negri, R. Zecchina, *Wide flat minima and optimal generalization in classifying high-dimensional Gaussian mixtures*, J. Stat. Mech. (2020) 124012.
11. L. T. Giorgini, U. D. Jentschura, E. M. Malatesta, G. Parisi, T. Rizzo, J. Zinn-Justin, *Two-loop corrections to the large-order behavior of correlation functions in the one-dimensional N-vector model*, Phys. Rev. D **101**, 125001 (2020).
10. C. Baldassi, E. M. Malatesta, R. Zecchina, *Properties of the geometry of solutions and capacity of multilayer neural networks with rectified linear unit activations*, Phys. Rev. Lett. **123**, 170602, (2019).
9. E. M. Malatesta, G. Parisi, G. Sicuro, *Fluctuations in the random-link matching problem*, Phys. Rev. E **100**, 032102, (2019).
8. S. Caracciolo, A. Di Gioacchino, E. M. Malatesta, *Selberg integrals in 1D random Euclidean optimization problems*, J. Stat. Mech. (2019) 063401.
7. S. Caracciolo, A. Di Gioacchino, E. M. Malatesta, C. Vanoni, *Average optimal cost for the Euclidean TSP in one dimension*, J. Phys. A: Math. Theor. **52** (2019) 264003.
6. R. Capelli, S. Caracciolo, A. Di Gioacchino, E. M. Malatesta, *Exact value for the average optimal cost of the bipartite traveling salesman and two-factor problems in two dimensions*, Phys. Rev. E **98**, 030101(R) (2018).
5. S. Caracciolo, A. Di Gioacchino, E. M. Malatesta, *Plastic number and optimal solutions for an Euclidean 2-matching in one dimension*, J. Stat. Mech. (2018) 083402.
4. S. Caracciolo, A. Di Gioacchino, M. Gherardi, E. M. Malatesta *Solution for a bipartite Euclidean traveling-salesman problem in one dimension*, Phys. Rev. E. **97**, 052109, (2018).
3. C. Lucibello, E. M. Malatesta, G. Parisi, G. Sicuro, *The random fractional matching problem*, J. Stat. Mech. (2018), 053301.
2. E. M. Malatesta, G. Parisi, T. Rizzo, *Two-Loop Corrections to Large Order Behavior of φ^4 Theory*, Nucl. Phys. B, **922**, (2017), 293–318.
1. S. Caracciolo, M.P. D'Achille, E. M. Malatesta, G. Sicuro, *Finite-size corrections in the random assignment problem*, Phys. Rev. E **95**, 052129, (2017).

TEACHING EXPERIENCE

- 2021-2022 | Lecturer of “Foundation of Physics II”, Bocconi University.
- 2019-2021 | Lecturer of Monte Carlo methods for the course of “Methods and data analytics for risk assessment”, Bocconi University.
- 2018-2021 | Teaching Assistant of “Fundamentals of Computer Science” and “Machine Learning”, Bocconi University.
- 2017-2018 | Teaching Assistant of “Modern Physics and Quantum Mechanics”, 40h, for the Bachelor degree in Physics at University of Milan.
- 2016-2017 | Teaching Assistant of “Modern Physics and Quantum Mechanics”, 20h, for the Bachelor degree in Physics at University of Milan.
- 2016-2017 | Tutor of the C++ course “Numerical treatment of experimental data”, 36h, for the Bachelor degree in Physics at University of Milan.

SUPERVISION OF STUDENTS

- Clarissa Lauditi, Master Thesis, “Statistical physics of learning in a neural network with positive weights”, 2020.
- Andrea Riva, Master Thesis, “The random Minimum Spanning Tree Problem”, 2019.
- Vittorio Erba, Master Thesis, “Random Euclidean Bipartite Matching with concave cost functions in 1d”, 2018.
- Carlo Vanoni, Bachelor Thesis, “Monopartite traveling salesman problem in one dimension”, 2018.
- Co-supervision of Francesco Borra, Master Thesis: “Generalization from correlated inputs in a simple model of supervised neural network”, 2018.
- Giuseppe Del Vecchio Del Vecchio, Bachelor Thesis: “On The Random Euclidean Assignment Problem in one dimension”, 2017.

TALKS

- 2019 DEC 13 | *On the role of wide flat minima and activation functions in two-layer neural networks*, invited group seminar, Sapienza University of Rome, Italy.
- 2019 JUL 8 | *On the role of wide flat minima in multi-layer neural networks*, Buenos Aires, Argentina, StatPhys 27.
- 2017 SEP 15 | *Finite-size corrections in matching and other combinatorial optimization problems*, group seminar, University of Milan, Italy.
- 2017 JUN 28 | *Finite-size corrections in the random assignment problem*, University of Parma, XXII Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi.

POSTERS

- 2019 | On the geometry of solutions and capacity of multi-layer neural networks with ReLU activations, 40th years of RSB, Sapienza University of Rome, Italy.
- 2018 | New Results on the Random Euclidean Traveling Salesman Problem, Sapienza University of Rome, Italy.
- 2017 | Finite-size corrections in the random assignment problem, Sapienza University of Rome, Italy.

CONFERENCES AND SCHOOLS ATTENDED

- 2020 FEB 16-21 | [Recent progress in glassy systems](#) at Les Houches, France.
- 2019 SEP 10-13 | [40 years of RSB](#) at Sapienza University of Rome, Italy.
- 2019 JUL 8-12 | [StatPhys27](#) at Auditorios UCA Puerto Madero, Buenos Aires, Argentina.
- 2019 JUN 24-JUL 6 | [Beg Rohu Summer School](#) at Saint Pierre Quiberon, France.
- 2018 SEP 19-22 | [Disordered serendipity: a glassy path to discovery. A workshop in honour of Giorgio Parisi's 70th birthday](#) at Sapienza University of Rome, Italy.
- 2018 JUN 4-6 | [23rd Claude Itzykson Conference: Statistical Physics of Disordered and Complex Systems: A tribute to Cirano De Dominicis](#) at Institut de Physique Théorique, CEA-Saclay, France.
- 2018 FEB 5-16 | [SFT 2018 - Lectures on Statistical Field Theories](#) at GGI, Florence, Italy.
- 2017 SEP 29-30 | [Statistical Field Theory and Applications](#) at SISSA, Trieste, Italy.
- 2017 SEP 18-20 | [Thermodynamics and Statistical Mechanics of Small Systems](#) at Sapienza University of Rome, Italy.
- 2017 SEP 6-9 | [The Statistical Physics Cornucopia](#) at Théâtre de la Reine Blanche, Paris, France.
- 2017 JUN 28-30 | [XXII Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi](#) at University of Parma, Italy.
- 2016 NOV 7-8 | [Optimal Transport and Applications](#) at Scuola Normale Superiore, Pisa, Italy.
- 2016 JUL 25-27 | [Renormalization Group Theory of Disordered Systems](#) at Ecole Normale Supérieure, Paris, France.
- 2016 JUL 18-22 | [StatPhys26](#) at Palais Des Congres, Lyon, France.
- 2016 JUL 11-16 | [Statistical physics methods in biology and computer science](#) at Ecole Normale Supérieure, Paris, France.
- 2016 FEB 8-19 | [SFT 2016 - Lectures on Statistical Field Theories](#) at GGI, Florence, Italy.

LANGUAGES

ITALIAN: Mother tongue

ENGLISH: Fluent

COMPUTER SKILLS

SYSTEMS: Unix/Linux, Windows

LANGUAGES: C/C++, Julia, Python, Mathematica, Bash

MARKUP: \LaTeX , Beamer

PACKETS: gnuplot, Tikz, pgfplots, feynMP

LIBRARIES: GSL, Eigen, Lemon, GLPK, Concorde