Davide Venturelli

Postdoctoral Researcher at Laboratoire de Physique Théorique de la Matière Condensée (Paris, Sorbonne Université)

Born in Brescia (Italy), 26th October 1994. Email: dventure@sissa.it, and my *homepage*

Scientific interests: Nonequilibrium statistical physics, non-Markovian dynamics, field theory and phase transitions, active matter, random matrix theory and disordered systems.

EDUCATION

2019-2023 **PhD in Statistical Physics at SISSA** (Trieste, Italy)
Thesis: *Stochastic dynamics in complex landscapes: from fluctuating fields to quenched disorder.* Supervisor: Prof. Andrea Gambassi.

2022-2023 **Visiting PhD student at LPTHE/LPTMC (**Sorbonne Univ., Paris, Apr-Jun '22, Mar-May '23)
Supervisors: Profs. Leticia F. Cugliandolo, Marco Tarzia, and Grégory Schehr.
Topic: *Replica methods for random matrix models*.

2017-2019 **Physics (Laurea Magistrale), Sapienza University of Rome**
Final result: 110/110 e Lode. Marks average 29.85/30.
Thesis: *Dynamical response to local perturbations of an active matter system with polar order.* Supervisor: Prof. Irene Giardina.

2014-2017 **Physics (Laurea Triennale), Sapienza University of Rome**
Final result: 110/110 e Lode. Marks average: 29.93/30.
Thesis: *Sulla realtà della funzione d'onda*. Supervisor: Prof. Fabio Sciarrino.

2013-2014 **Physics, Queen Mary, University of London**
I completed the first year of my Bachelor Degree in London before moving to Rome.
Final result: 1:1 (First Class Honors).

2008-2013 **Liceo Scientifico Leonardo, Brescia, Italy**
Final mark: 100/100 e Lode. Final modules average 9.55/10.
Covered the position of Head Student for 4 years in a row.

TEACHING EXPERIENCE AND INSTITUTIONAL ROLES

2022-2023 **Teaching assistant** (International Master, Physics of Complex Systems – SISSA)
Introduction to Quantum Mechanics, Quantum Statistics and Field theory (Prof. A. Rosa)

2022-2023 **PhD student representative in SISSA wellbeing and equal opportunities committee (CUG)**

2020-2022 **PhD student representative in SISSA Board of Directors**

PUBLICATIONS & PREPRINTS

2024 — *T. Berlioz, D. Venturelli, A. Grabsch, O. Bénichou*, Current fluctuations in the symmetric exclusion process beyond the one-dimensional geometry, *arXiv:2407.14317*

2024 — *L. F. Cugliandolo, G. Schehr, M. Tarzia, D. Venturelli*, Multifractal phase in the weighted adjacency matrices of random Erdös-Rényi graphs, *arXiv:2404.06931*

2023 — *D. Venturelli, S. A. M. Loos, B. Walter, É. Roldán, A. Gambassi*, Stochastic thermodynamics of a probe in a fluctuating correlated field, *2024 EPL **146** 27001*

2023 — *D. Venturelli, A. Gambassi*, Memory-induced oscillations of a driven particle in a dissipative correlated medium, *2023 New J. Phys. **25** 093025*

2023 — *E. Loffredo, D. Venturelli, I. Giardina*, Collective response to local perturbations: how to evade threats without losing coherence, *2023 Phys. Biol. **20** 035003*

2022 — *D. Venturelli, L. F. Cugliandolo, G. Schehr, M. Tarzia*, Replica approach to the generalized Rosenzweig-Porter model, *SciPost Phys. **14**, 110 (2023)*

2022 — *D. Venturelli, M. Gross*, Tracer particle in a confined correlated medium: an adiabatic elimination method, *J. Stat. Mech. (2022) 123210*

2022 — *D. Venturelli, A. Gambassi*, Inducing oscillations of trapped particles in a near-critical Gaussian field, *Phys. Rev. E **106**, 044112 (2022)*

2022 — *D. Venturelli, F. Ferraro, A. Gambassi*, Nonequilibrium relaxation of a trapped particle in a near-critical Gaussian field, *Phys. Rev. E **105**, 054125 (2022)*

AWARDS & FELLOWSHIPS

2022-2023 — **Erasmus+** Mobility Traineeship *2020-1-IT02-KA103-078180 and 2022-1-IT02-KA131-HED-000067727*

2019 — **Borsa di studio "Enrico Persico", Accademia Nazionale dei Lincei** (Rome, Italy)
Awarded to top Physics students in Rome (Italy).

2015-2017 — **Percorso di Eccellenza** *(Sapienza, Rome)*
Awarded to top students in the Physics degree course.

CONTRIBUTED/INVITED TALKS

2024 Sep 25 — **Fluctuations in small complex systems VII** (Venice, Italy)
Invited talk: *Interacting particles in d>1 and on comb-like structures*

2024 Jun 24 — **IV Conference SIFS** (Società Italiana di Fisica Statistica, Parma, Italy)
Contrib. talk: *Multifractality in disordered graphs: insights from two random matrix models*

2024 Jan 25 **Journées de Physique Statistique** (ENS Paris, France)
Contrib. talk: *Probing the fractal phase of a random matrix using replicas*

2023 Aug 9 **StatPhys28** (Tokyo University, Japan)
Contrib. talk: *Dynamics of tracer particles in a fluctuating correlated medium*

2022 Sep 30 **Italian Soft Days** conference (Università di Bari, Italy)
Contrib. talk: *Dynamics of probe particles in near-critical fields*

2022 Jun 23 **Laboratoire Matière et Systèmes Complexes** (Université Paris Cité)
Invited talk: *Dynamics of probe particles in near-critical fields*

2022 Jun 20 **iGent Electronics and Information Systems** (Ghent University, Belgium)
Invited talk: *Dynamics of probe particles in near-critical fields*

2022 Apr 29 **Laboratoire de Physique Théorique et Hautes Énergies** (Sorbonne Université, Paris)
Invited talk: *Dynamics of probe particles in near-critical fields*

CONFERENCES AND SCHOOLS

2023 **School of the Italian Society of Statistical Physics** (IMT Lucca, August 28 – September 7)

2022 **Non-Markovian Dynamics Far From Equilibrium** (ICTP Trieste, online, 4-6 May)
Poster: *Dynamics of probe particles in near-critical fields*

2022 **Fluctuation-induced Forces** – WE-Heraeus-Seminar (Bad-Honnef, online, 14-17 February)
Poster: *Dynamics of probe particles in near-critical fields*

2021 **Statistical Physics of Complex Systems** (ICTP Trieste, 8-10 September)
Poster: *Dynamics of probe particles in fluctuating fields*

2021 **Fundamental Problems in Statistical Physics XV** (summer school, Bruneck, 11-24 July)
Poster: *Dynamics of probe particles in fluctuating fields*

2020 **Lectures on Statistical Field Theory** (winter school, GGI Florence, 3-14 February).

REFEREEING ACTIVITY

Physical Review Letters, Physical Review B, SciPost Physics, Soft Matter.

SKILLS AND LANGUAGES

Languages Italian (native), English (full working proficiency, C1 CAE 2013), French (B2), Portuguese (B1).

IT Programming: C, Phyton – extensive molecular dynamics simulations.
Familiar with key algorithms in computational statistical mechanics – see my GitHub page.
Data analysis, scientific writing: Mathematica, LaTeX, Gnuplot, R, MatLab.

WORK EXPERIENCE, VOLUNTARY ACTIVITIES

2021 **Scientific outreach**
"Approssimare è umano (e scientifico)", live @ilfisicozuzzerellone
“Kant e i robot”, live @virtualmartire

2018 **Laboratory work with Prof. Fabio Sciarrino’s Quantum Optics Group (Sapienza, Rome)**
Integrated multimode interferometry for photonic boson sampling on a glass chip.

2006-2019 **Student tutoring and guitar teaching**
Private lessons in Maths, Physics and Music to students aged 12-26 (self-employed).

2016-2019 **Working Team Leader, Erasmus Student Network (ESN Roma ASE)**
Leading a group of ~20 people in planning cultural activities for Erasmus students in Rome.

2013-2014 **Secretary, Amnesty International Society (Queen Mary, University of London)**
Planning of conferences, debates, fund raising campaigns, social nights.

Leisure interests: music (Fusion/Jazz guitar, vocals, acoustic live performing), sports (agonistic running, karate, free calisthenics), philosophy (founder of debate groups in Rome).

References available upon request.
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