

CURRICULUM VITAE

Biography

Name: Davide
Surname: Rossini
Date of birth: 14 July 1979
Place of birth: Como (Italy)
Nationality: Italian
Marital status: Married

Professional Address

University of Pisa
Largo B. Pontecorvo, 3
I-56127 Pisa (Italy)
tel.: +39-050-2214-930
email: davide.rossini@unipi.it
webpage: daviderossini.wordpress.com

Present position

Associate Professor in Theoretical Physics (sec. 02/A2) at University of Pisa (UniPi).

Formation

- 24/09/2007 **PhD in Physics** (70/70 cum laude)
Thesis: “*Quantum information processing and quantum spin systems*”
Supervised by Prof. Rosario Fazio.
Keywords: quantum communication algorithms, decoherence, quantum spin chains, Bose-Hubbard chain, density matrix renormalization group.
- 2004 – 2006 PhD student at Scuola Normale Superiore (SNS)
- 09/07/2003 **Degree in Physics** (110/110 cum laude)
Thesis: “*Stabilità ed entanglement eco nel calcolo quantistico*”
Supervised by Prof. Giulio Casati and Prof. Giuliano Benenti
Keywords: quantum information, quantum chaos
- 1998 – 2003 Master in physics at the University of Insubria (Como).

Previous Employments

- 2017 – 2019 **Senior Researcher** at UniPi.
Keywords: many-body quantum physics, quantum simulation, quantum computation
- 2013 – 2017 **Junior Researcher** at SNS.
Keywords: quantum simulators (ultracold atoms, coupled QED cavities), equilibrium and out-of-equilibrium properties of quantum many-body systems
- 2010 – 2013 **Research fellowship** at SNS.
Financed through EU project “SOLID – Solid state systems for quantum information processing” (FP7-ICT-2009-4).
Leader: prof. Rosario Fazio.
Keywords: strongly correlated quantum systems in one dimension, numerical techniques.
- 2007 – 2010 **Post doc** at the International School of Advanced Studies (SISSA) of Trieste.
Leader: prof. Giuseppe Santoro.
Keywords: quantum quenches, thermalization in closed quantum systems.

Summary of teaching and supervising activity

- Teacher of “*Numerical Methods*” for master students in physics at UniPi (2018 – now).
- Teacher of “*General Physics*” for computer scientists at UniPi (2017 – now).
- Teacher of “*Statistical Mechanics*” at SNS (2015 – 2017).
- Co-teacher of “*Quantum Information and many body theory*” at SNS (2013 – 2017).
- Supervisor of: 1 PhD student, 4 master students (as an independent researcher), and 3 postdocs, 3 PhD students, 3 master students (with the former PhD advisor).

Research interests

Strongly correlated quantum systems in low dimensions

- quantum phase transitions and quantum magnetism
- non-equilibrium physics of many-body quantum systems, quantum quenches, thermalization

Numerical algorithms

- density matrix renormalization group (DMRG)
- matrix product states (MPS) and tensor networks
- quantum trajectories and methods for open systems

Quantum information meets many-body physics

- entanglement and non-classical correlations
- decoherence, quantum baths, quantum spin chains
- chaos and ergodicity in quantum statistical mechanics

Summary of scientific activity

– **Publication record** (data taken from *Web of Science*, updated on January 2020)

Comprises co-authored articles in journals including: *Nat. Commun.*, *Phys. Rev. Lett.*, *X*, *A*, *B*, *E*.

ORCID number 0000-0002-9222-1913

Total number of articles > 90

Total number of citations ~ 2400

h-index 28

– **One book** with G. Benenti, G. Casati, G. Strini: “*Principles of Quantum Computation and Information: A Comprehensive Textbook*” (World Scientific Press, Singapore, 2019).

– Participation to several international conferences/workshops giving **24 invited talks**.

Grants and awards

2019 – 2022 Local coordinator of a **PRIN 2017 – “Progetto di Ricerca di Interesse Nazionale”**, granted by the Italian Ministry of Universities and Research (MIUR), entitled: “*Low-dimensional quantum systems: theory, experiments and simulations*”. Budget of Pisa unit: 150 k€.

2017 – 2019 Various internal projects from the University of Pisa & minor grants. Total budget: 20k€.

2015 – 2017 PI of four “Class C projects” for the ISCRA Program at the Italian CINECA, in order to exploit some computational resources (in total approx. 250.000 hours of computational time).

2013 – 2016 PI of a **FIRB 2012 – “Futuro in Ricerca 2012”** project, granted by MIUR entitled: “*Probing novel phases of matter with artificial quantum simulators*”. Budget: 860k€ between 3 partners.

2013 – 2018 Italian qualification (“ASN”) to the role of Full Professor in Theoretical Physics (Sec. 02/A2) and in Theoretical condensed matter physics (Sec. 02/B2).

2017 French qualification to the role of Professeur des Universités in Milieux denses et matériaux (Sec. 28) and in Milieux dilués et optique (Sec. 30).

2011 Study award “*Gilberto Bernardini*” for the best PhD thesis in the science class of SNS, during the period 2007-2009.

Scientific responsibility and service

2017 – now Affiliated at INFN (Istituto Nazionale di Fisica Nucleare – sezione di Pisa).

2018 – now Member of the scientific committee in the Physical Sciences area at UniPi.

2016 Member of the committee for 1st year entrance examination at SNS.

2013 – now External Examiner of 6 PhD theses.

2006 – now Referee for several scientific journals, including *Science*, *Phys. Rev. Lett.*, *X*, *A*, *B*, and *E*, *Nature Communications*, *Scientific Reports*, *New J. Phys.*, *J. Stat. Mech.*, *J. Phys. A*, *B*.

2005 – now Member of an “IBM Linux on Power Innovation Grant” for the development of an open-source DMRG code written in Fortran language – qti.sns.it/dmrg/phome.html.