

Riccardo Zecchina

Full professor of Theoretical Physics and Chair in Machine Learning, Bocconi University

Education:

Graduated in Electronic Engineering, from Polytechnic University of Turin, 1988; Ph.D. in Theoretical Physics, from University of Turin, 1993 and Post-doc with Tullio Regge

Academic positions:

- 2017 (February) - present, full professor Bocconi University, Milan
- 2007- 2017, full professor in theoretical physics, Polytechnic University of Turin, Italy
- 2001-2007 Research Scientist, International Centre for Theoretical Physics (ICTP), Head of the Statistical Mechanics and Interdisciplinary Applications group
- 1999-2001, Tenure position, Assistant Research Scientist, ICTP
- 1997-1999, Tenure track, Theoretical Physics ICTP

Long term Visiting Researcher:

- 2010-2016 Visiting Researcher, Microsoft Research New England,
- 2007-2008 Visiting Researcher, Microsoft Research Redmond, Theory Group
- 2001-2004, CNRS Visiting Researcher, Université Paris Sud, Lab. de Physique Theorique and Modeles Statistiques

Major honors:

- 2016 Lars Onsager Prize (American Physical Society) in Theoretical Physics, "For innovative work applying spin glass ideas to computational problem sets, producing both new classes of efficient algorithms and new perspectives on phase transitions in their structure and complexity," shared with M. Mezard and G. Parisi.
- 2011, European Research Council, ERC Advanced grantee, "Optimization and inference algorithms from the theory of disordered systems"
- 2015, E. Kramer Prize, 2015, for contributions in biophysics and biomathematics, Milan Academy of Sciences.
- 2019, Elected Member of the National Academy of Sciences (Italy)

Research:

My research activity lies at the interface between theoretical statistical physics, computer science, information theory, and computational biology. I am particularly interested in fundamental theoretical and algorithmic problems in computation and modeling. In the last decade I have worked on: statistical physics of disordered systems, combinatorial optimization, source coding, message-passing algorithms, out-of-equilibrium analysis of algorithms, Learning theory and learning algorithms, Quantum Annealing, Computational biology and computational neuroscience.

I have authored about 150 publications in international refereed journals, in addition to several conference papers, book chapters, edited books, and two patents. A relatively complete list of publication can be found [here](#) on google scholar and on the ArXiv.

I was lucky enough to work with fantastic colleagues.

Major organizational assignments at national and international level:

- 2022 – present, Head of the Computing Science Department at Bocconi University
- 2019 - present, Fellow and research Director of the European Laboratory for Learning and Intelligent Systems
- 2019 - present, Director of the Bachelor program “Mathematical and Computing Sciences for AI”, Bocconi University
- 2015-2016, VQR 2011-14: chair of GEV/02 (Physics)
- 2011- present, Area Scientific Director, Journal of Statistical Mechanics JSTAT
- 2013 - 2018, European Research Council, member of the PE6 Panel for Advanced Grants
- 2011-2017, Head of Unit of Statistical Inference, Human Genetics Foundation
- 2010-2017, Fellow of the Collegio Carlo Alberto research Foundation
- 2010 AERES Evaluation Committee for the Ecole Normale Superieure, Paris
- 2011 - 2014, Coordinator of the trilateral International Master's program in “Physics of Complex Systems”. Polytechnic University of Turin, SISSA (International School for Advanced Studies) Trieste, Universities of Paris VI, VII, XI.

Conference organization:

During my period at ICTP 1997-2007, I have organized the following Workshops, Conferences and Schools: - *Summer School on Statistical Physics and Probabilistic Methods in Computer Science, 1999*; - *Conference, NP-hardness and Phase transitions, 1999*; - *School on Neural Information Processing, 1999*; - *Workshop, Graph Theory and Statistical Physics, 2000*; - *School on Statistical Physics, Probability Theory and Computational Complexity, 2002*; - *Conference “Typical case complexity, randomness and analysis of search algorithms”, 2002*; - *Conference on “Kolmogorov’s Legacy in Physics: One Century of Chaos, Turbulence and Complexity”, 2003*; - *School and Conference on Fundamental Aspects of Complexity, 2004*; - *School and Workshop on Structure and Function of Complex Networks, 2005*; - *School and Workshop on Theory and Technology in Quantum Information, Communication, Computation and Cryptography, 2006*; - *Conference and School on Modeling Elastic Manifolds: from Soft Condensed Matter to Biomolecules, 2006*

More recently I have been in the program committee of conferences on optimization, machine learning and computational biology in the US, Europe, Israel and China (online).

Major international research grants

European Research Grants: OPTINF, ERC Advanced (2011-2015); European networks (2004-2016): STIPCO; EVERGROW; STAMINA; NETADIS. US grants: Microsoft Research Individual International Grant (2007-2010); Office of Naval Research, 2019-2021. Italian Grants: PRIN on the Physics of disordered systems

Invited Talks and Lectures

I have been invited speakers to about 90 international conferences and workshops since 2001, including 10 plenary talks at top conference in statistical physics, computer science, machine learning and applied mathematics in US, Europe and China. I have lectured and given colloquia in several major institutions and international Schools (e.g. Les Houches (FR), Scuola Normale Superiore Pisa & SISSA (IT), Kings College and Oxford (UK), Landau Institute Moskow (2018) and at the Padua University (2019))