

FEDERICO RICCI TERSENGHI

Curriculum Vitae

SURNAME AND NAME: **Ricci Tersenghi, Federico**
PLACE AND DATE OF BIRTH: Roma (Italy). July 9, 1972
CITIZENSHIP: Italian
CURRENT POSITION: Associate Professor in Theoretical Physics
(SSD FIS/02, SC 02/A2)
at Sapienza University of Rome
PERMANENT ADDRESS: Via Cesare Fani, 121
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SPOKEN LANGUAGES: Italian (native), Spanish (as native),
English (fluent), French (moderate)

Education

1990 – 1995 Graduate studies in Physics at the Physics Department of the University of Rome “La Sapienza” with an average mark of 29.94/30.
July 14, 1995. Degree on Physics Cum Laude. Thesis advisor: Prof. Giorgio Parisi.
November, 1995 Ranked first at the admission test for the Ph.D program at Scuola Normale Superiore in Pisa.
November, 1995 – October, 1998 Ph.D. student in Physics at the Physics Department of the University of Rome “La Sapienza”. Thesis on *Off-equilibrium dynamical studies in disordered systems*. Advisor: Prof. Giorgio Parisi. **March 15, 1999** Ph.D. degree in Physics.
November, 1998 – October, 2000 Post-Doc at the Condensed Matter Group of the “Abdus Salam” International Center for Theoretical Physics (ICTP) in Trieste (Italy).

Academic appointments

November, 2000 – October, 2001 Visiting Scientist at the Condensed Matter Group of the “Abdus Salam” International Center for Theoretical Physics (ICTP) in Trieste (Italy).
September, 2001 – February, 2002 Contract for scientific collaboration within the research group of Prof. Giorgio Parisi at Sapienza University of Rome.
March, 2002 – 2010 Assistant Professor (Ricercatore) at the Physics Department of Sapienza University of Rome (SSD FIS/02).
May – June, 2006 Invited to the Isaac Newton Institute in Cambridge (UK) for the programme on “*Principles of the Dynamics of Non-Equilibrium Systems*”.
2007 Invited as a Visiting Assistant Researcher to the University of California at Berkeley for 7 months (January 15 – August 15, 2008). For personal reasons he had to decline the invitation.
2011 – present Associate Professor at the Physics Department of Sapienza University of Rome (SSD FIS/02, SC 02/A2).

March – April, 2012 Visiting Professor for one month at the LPTMS of Université Paris Sud.
February – March, 2015 Visiting Professor for one month at Institut Henri Poincaré, Paris.
March – April, 2016 Visiting Professor for one month at the LPTMS of Université Paris Sud.
January – February, 2019 Invited to the Kavli Institute for Theoretical Physics in Santa Barbara (CA) for the program entitled “*The rough high-dimensional landscape problem*”.

Teaching experience

All following courses, unless differently specified, have been given at Sapienza University of Rome.

- 2017–2018** Lecturer of *Meccanica Statistica* (6 CFU, LM Matematica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2016–2017** Lecturer of *Meccanica Statistica* (6 CFU, LM Matematica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2015–2016** Lecturer of *Meccanica Statistica* (6 CFU, LM Matematica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2014–2015** Lecturer of *Meccanica Statistica* (6 CFU, LM Matematica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2013–2014** Lecturer of *Fisica* (6 CFU, LT Informatica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2012–2013** Lecturer of *Fisica* (6 CFU, LT Informatica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2011–2012** Lecturer of *Fisica* (6 CFU, LT Informatica) and *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2010–2011** Lecturer of *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2009–2010** Lecturer of *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2008–2009** Lecturer of *Laboratorio di Fisica Computazionale I* (6 CFU, LT Fisica).
- 2007–2008** Lecturer of *Laboratorio di Fisica Computazionale II* (6 CFU, LT Fisica) and *Calcolo delle Probabilità* (6 CFU, LT Fisica).
- 2006–2007** Lecturer of *Laboratorio di Fisica Computazionale II* (6 CFU, LT Fisica) and *Calcolo delle Probabilità* (6 CFU, LT Fisica).
- 2005–2006** Lecturer of *Laboratorio di Fisica Computazionale II* (6 CFU, LT Fisica) and *Calcolo delle Probabilità* (6 CFU, LT Fisica).
- 2004–2005** Lecturer of *Laboratorio di Fisica Computazionale II* (6 CFU, LT Fisica).
- 2003–2004** Lecturer of *Laboratorio di Fisica Computazionale II* (6 CFU, LT Fisica) and *Fisica Medica* (6 CFU, LCU Medicina).
- 2002–2003** Teaching assistant to *Laboratorio di Fisica Computazionale I* and *Modelli e Metodi Matematici per la Fisica*, and Lecturer of the Ph.D. course *Physics of Disordered Systems*.
- 2000–2001** Teaching assistant to *Combinatorial Optimization, Algorithms and Random Structures*, at the “Abdus Salam” ICTP (Trieste, Italy).

Coauthor (with L.M. Barone, E. Marinari, G. Organtini) of the **textbook** *Programmazione Scientifica* (650 pages, in Italian) edited by Pearson Education (Milan, 2006) and of the **textbook** *Scientific Programming: C-language, algorithms and models in science* (712 pages) edited by World Scientific (Singapore, 2013). These books are meant as didactic support for 3 courses on Computational Physics (6 CFU each).

Invited lecturer to the following International Schools of Physics:

- “*Advanced Cavity Applications*” at the Boulder School for Condensed Matter and Materials Physics on ‘Frustrated and Disordered Systems’. Boulder, Colorado (USA). July 3–28, 2017.
- “*Thermodynamics and out of equilibrium dynamics in disordered systems*” at the Spring College on the Physics of Complex Systems. ICTP, Trieste. April 10 – May 5, 2017.
- “*Open questions in the long-time dynamics of glassy systems*” at the Netadis Summer Retreat. Bovec (Slovenia). July 5–19, 2015.
- “*A statistical mechanics approach to optimization problems*” at the 2nd Asian-Pacific School on ‘Statistical Physics and Interdisciplinary Applications’. Beijing. March 3–14, 2008.
- “*Optimization and inference*” at the 1st Latin-American School and Conference on ‘Statistical Physics and Interdisciplinary Applications’. La Havana, Cuba. February 28 – March 12, 2005.

Honors

- 2017** ‘Premialità’ (rewarding) by Sapienza University for the merits in teaching and research.
- 2016** Highest marks in the VQR 2011–2014 (evaluation of research quality).
- 2014** Abilitazione Scientifica Nazionale (national scientific qualification) to Full Professor in Theoretical Physics (SC 02/A2).
- 2012** Highest marks in the VQR 2004–2010 (evaluation of research quality).
- 2008** Prize “Tomassoni-Chisesi” of € 13,333 assigned by *Fondazione Roma Sapienza* for the relevant contributions given to the progress of Physics.
- 1992, 1994** Prize in Physics “E. Persico” assigned by the *Accademia Nazionale dei Lincei*.

Grants and projects

- 2018** PI of the FFABR (basic research funding) awarded by MIUR (€ 3,000).
- 2017–2019** PI of the research project on “Study of memory effects in the long time out of equilibrium dynamics of spin glass models” funded by Sapienza University of Rome with € 13,800.
- 2016** National coordinator of the INFN Research Network on “Equilibrium and Non-Equilibrium Statistical Mechanics of disordered systems, paradigms and Applications: from the amorphous state to systems biology and brain functioning” (ENESMA).
- 2015–2017** PI of the research project on “Optimizing complex systems via biased dynamics and quantum fluctuations” funded by Sapienza University of Rome with € 9,000.
- 2014–2016** PI of the research project on “Numerical simulations of discrete approximations to spin glasses with continuous variables” funded by Sapienza University of Rome with € 13,000.
- 2013–2015** PI of the research project on “Inverse problems in complex Ising models” funded by Sapienza University of Rome with € 7,000.
- 2012–2013** PI of the research project on “Large scale numerical simulations of models with long range interactions” funded by Sapienza University of Rome with € 8,000.
- 2012–2013** PI of the research project on “Inverse Ising problem and graph reconstruction” funded by Sapienza University of Rome with € 12,000.
- 2010–2015** PI of the FIRB project on “Inference and optimization in complex systems: from the

thermodynamics of spin glasses to message passing algorithms” funded with € 412,200.

2005 PI of “Progetto di Supercalcolo” INFM–CINECA project for parallel computing: roughly 30,000 hours awarded.

2002 PI of “Progetto Giovani Ricercatori” awarded by the Sapienza University of Rome (€ 5,500).

2016–2019 Participant to the PRIN (research project of national interest) on “Statistical mechanics and complexity” funded with € 440,000.

2012–2015 Participant to the PRIN (research project of national interest) on “Statistical mechanics of disordered and complex systems” funded with € 835,100.

2006–2008 Participant to the PRIN (research project of national interest) on “Complex problems in statistical mechanics and field theory” funded with € 221,000.

2004–2007 Participant to the ECC Integrated Project EVERGROW, with the role of coordinator of the workpackage on “Belief and survey”.

2002–2006 Participant to the ECC MTR Network DYGLAGEMEM.

2002–2006 Participant to the ECC MTR Network STIPCO.

Thesis supervised and reviewed

Supervisor of 23 undergraduate (B.Sc.) thesis and 28 master (M.Sc.) thesis in Physics.

Supervisor of the following 8 Ph.D. thesis in Physics:

- *On the optimal use of the Bethe approximation for models on graphs with loops* by Gabriele Perugini (2017).
- *Critical properties of disordered XY model on sparse random graphs* by Cosimo Lupo (2016).
- *Statistical physics of linear and bilinear inference problems* by Christophe Schülke (2016).
- *Finite size corrections to disordered systems: mean field results and applications to finite dimensions* by Carlo Lucibello (2014).
- *Random magnets on random graphs* by Flaviano Morone (2013).
- *Boolean constraint satisfaction problems for reaction networks* by Alessandro Seganti (2013).
- *Renormalization group and critical properties of long range models* by Maria Chiara Angelini (2012).
- *The multi p-spin model: comparing TAP states and out-of-equilibrium dynamics* by Tommaso Castellani (2006);

Currently supervising the Ph.D. thesis of Giampaolo Folena (from 2016), Angelo Cavaliere (from 2017) and Rafael Diaz (from 2017).

External referee and/or member of the final examination commission for the following Ph.D. thesis:

- Claudia Battistin, *Dynamics of randomly connected neural networks and inference in the presence of hidden nodes*, Norwegian University of Science and Technology, December 6th, 2018.
- Enrico Maria Malatesta, *Random Combinatorial Optimization Problems: Mean Field and Finite-Dimensional Results*, Università degli Studi di Milano, November, 2018.
- Alessandro Tartaglia, *Coarsening and percolation in 2d kinetic Ising models & Quench dynamics of the isolated $p = 2$ spherical spin glass model*, Sorbonne Université, September 27th,

2018.

- Luca Saglietti, *Out of Equilibrium Statistical Physics of Learning*, Politecnico di Torino, April 9th, 2018.
- Maxime Sevelev, *Phase diagram, jamming and glass transitions in the non-convex perceptron*, Université de Paris Sud XI (Orsay), October 6th, 2017.
- Anna Paola Muntoni, *Statistical mechanics approaches to optimization and inference*, Politecnico di Torino, April 5th, 2017.
- Corrado Rainone, *Following the evolution of metastable glassy states under external perturbations: compression and shear-strain*, ENS Paris and Università “La Sapienza” di Roma, December 21st, 2015.
- Marco Baity Jesi, *Energy Landscape in 3-Dimensional Heisenberg Spin Glasses*, Universidad Complutense de Madrid, October 16th, 2015.
- Jean Barbier, *Statistical physics and approximate message passing algorithms for sparse linear estimation problems in signal processing and coding theory*, ENS Paris, September 18th, 2015.
- Hong-Li Zeng, *Connectivity inference with asynchronously updated kinetic Ising models*, Aalto University, June, 2014.
- Guido Uguzzoni, *Statistical mechanics models for biological systems: cooperativity in biochemistry and affinity maturation of antibodies*, Università di Parma, March 11th, 2014.
- Jason Sakellariou, *Inverse Inference in the Asymmetric Ising Model*, Université de Paris Sud XI (Orsay), February 22th, 2013.
- Beatriz Seoane Bartolomé, *Spin glasses, the quantum annealing, colloidal glasses and crystals: exploring complex free-energy landscapes*, Universidad Complutense de Madrid, January 25th, 2013.
- Michele Castellana, *The Renormalization Group for Disordered Systems*, Université de Paris Sud XI (Orsay) and Università “La Sapienza” di Roma, January 31st, 2012 (president of the commission).
- David Yllanes Mosquera, *Rugged Free-Energy Landscapes in Disordered Spin Systems*, Universidad Complutense de Madrid, October 21st, 2011.
- Aurelien Decelle, *Statistical physics of disordered networks. Spin Glasses on hierarchical lattices and community inference on random graphs*, Université de Paris Sud XI (Orsay), October 11th, 2011.
- Timothy Rogers, *New results on the spectral density of Random Matrices*, Kings College London, September 17th, 2010.
- Thierry Mora, *Geometrie et inference dans l’optimization et en théorie de l’information*, Université de Paris Sud XI (Orsay), September 24th, 2007.

Publications

Author of **2** books:

L.M. Barone, G. Organtini, E. Marinari, F. Ricci-Tersenghi
PROGRAMMAZIONE SCIENTIFICA
650 pages, Pearson Education Italia (2006)

L.M. Barone, G. Organtini, E. Marinari, F. Ricci-Tersenghi

SCIENTIFIC PROGRAMMING: C-LANGUAGE, ALGORITHMS AND MODELS IN SCIENCE
716 pages, World Scientific, Singapore (2013)

The full list of the scientific publications is at the end of this cv. Number of citations have been extracted from databases on 16/4/2018.

	Google Scholar	ISI-WoS	Scopus
Number of products	137	121	138
Total citations	4123	2618	2809
Citations per product	30.09	21.64	20.36
Hirsch (H) index	37	29	31
Normalized H index	1.95	1.53	1.63

Affiliations

- from 2010: Researcher associated to Consiglio Nazionale delle Ricerche (CNR).
- from 2009: Researcher associated to Istituto Nazionale di Fisica Nucleare (INFN).
- 2001–2009: Researcher associated to Istituto Nazionale di Fisica della Materia (INFM).
- 1995–2000: Researcher associated to Istituto Nazionale di Fisica Nucleare (INFN).

Conferences organized

- *40 years of Replica Symmetry Breaking*. Sapienza University, Roma. September 10–13, 2019.
- *Disordered serendipity: a glassy path to discovery*. Sapienza University, Roma. September 19–21, 2018.
- *SIF 101st National Congress*. Sapienza University, Roma. September 21–25, 2015. Roughly 600 participants.
- Workshop on *Critical Phenomena in Random and Complex Systems*. Villa Orlandi, Anacapri. September 9–12, 2014.
- School and workshop on *Spin Glass and Beyond: An old tool for new problems*. Cargese, France. August 25 - September 6, 2014.
- Autumn school on *Statistical physics, Optimization, Inference and Message-Passing algorithms*. Les Houches, France. September 30 – October 11, 2013.
The lectures notes have been collected in a book *Statistical Physics, Optimization, Inference, and Message-Passing Algorithms*, edited by F. Krzakala, F. Ricci-Tersenghi, L. Zdeborova, R. Zecchina, E. W. Tramel and L. F. Cugliandolo. Oxford University Press (2015).
- Meeting on *Bridging statistical physics and optimization, inference and learning*. Les Houches, France. February 20–24, 2012.
- *ECCS'08. The 5th European Conference on Complex Systems*. Hebrew University, Jerusalem. September 14–19, 2008. Roughly 300 participants.
- *Wandering with Curiosity in Complex Landscapes: A scientific conference in honor of Giorgio Parisi for his 60th birthday*. Sapienza University and Accademia dei Lincei, Roma. September 8–10, 2008. Roughly 200 participants.

- *EPS – CMD 22, 2008. The 22nd General Conference of the Condensed Matter Division of the European Physical Society.* Sapienza University, Roma. August 25–29, 2008. Roughly 600 participants.
- Conference on *Common Concepts in Statistical Physics and Computer Science*, satellite of STATPHYS 23. ICTP, Trieste. July 2–6, 2007.
- Meeting on *Statistical Physics of Glasses, Spin Glasses, Information Processing and Combinatorial Optimization.* Les Houches, France. February 20–24, 2006.
- Meeting on *Statistical Physics of Disordered Systems and its Applications.* Accademia dei Lincei, Roma. September 5–8, 2005.
- Meeting on *Statistical Physics of Glasses, Spin Glasses, Information Processing and Combinatorial Optimization.* Les Houches, France. January 31 – February 4, 2005.
- School and Conference on *Fundamental Aspects of Complexity.* ICTP, Trieste. September 6–10, 2004. More than 120 participants.
- Workshop on *Statistical Physics and Computational Problems: Beyond the Analogy.* Institut Henri Poincaré, Paris. June 14–16, 2004.

Experience as editor and reviewer

Associate editor for Journal of Statistical Physics.

Editor of the lecture notes *Statistical Physics, Optimization, Inference, and Message-Passing Algorithms*, edited by F. Krzakala, F. Ricci-Tersenghi, L. Zdeborova, R. Zecchina, E.W. Tramel and L.F. Cugliandolo. Oxford University Press (2015).

Guest Editor for the Special Issue on *Statistical Physics of Disordered Systems: from real materials to optimization and codes*, J. Phys. A **36** (2003).

Referee for the following journals:

- Science
- Nature Physics
- Nature Communications
- Scientific Reports
- Proceeding of the National Academy of Science
- Physical Review X
- Physical Review Letters
- Physical Review B
- Physical Review E
- Europhysics Letters
- Journal of Physics A: Mathematical and General
- The European Physical Journal B
- Journal of Statistical Mechanics: Theory and Experiment
- Journal of Statistical Physics
- Nuclear Physics B
- Frontiers in Physics
- Plos One
- PLOS Computational Biology

- SIAM Journal on Discrete Mathematics
- IEEE Transactions on Information Theory
- Journal of Experimental Algorithmics

Publons **Peer Review Award 2018** (top 1% of reviewers in Physics).

Publons **Peer Review Award 2017** (top 1% of reviewers in Mathematics).

Data available at <http://publons.com/a/488125/>.

Reviewer for ANVUR, the Italian national agency for the evaluation of university and research, and for ANR, the French national research agency.

Oral presentations

- *Belief Propagation and Monte Carlo based algorithms to solve inference problems on sparse random graphs.*
Invited speaker at the workshop on ‘Statistical Physics and Machine Learning back together’. Cargese, France. August 20–31, 2018.
- *On the complex behaviour of disordered models in a field.*
Invited speaker at the Statistical Physics seminar. SISSA, Trieste. March 13, 2018.
- *Discussion on the talk “First steps towards a non-perturbative RG approach for spin glasses in finite dimensions” by Marco Tarzia.*
Invited speaker at the workshop on ‘Beyond Mean Field Theory: Renormalisation Group and Non Perturbative approaches to Disordered and Glassy Systems’. Sapienza University, Rome. January 3–5, 2018.
- *Advanced Cavity Applications.*
Invited lecturer at the 2017 Boulder School for Condensed Matter and Materials Physics on ‘Frustrated and Disordered Systems’. Boulder, Colorado (USA). July 3–28, 2017.
- *Thermodynamics and out of equilibrium dynamics in disordered systems.*
Invited lecturer at the Spring College on the Physics of Complex Systems. ICTP, Trieste. April 10 – May 5, 2017.
- *Community Detection via Semidefinite Programming.*
Invited speaker at the workshop on ‘Statistical physics, Learning, Inference and Networks’. Les Houches, France. February 26 – March 3, 2017.
- *Critical properties of the disordered XY model on random graphs.*
Invited speaker at the workshop on ‘Renormalization Group Theory of Disordered Systems’. Ecole Normale Supérieure, Paris. July 25–27, 2016.
- *Phase Transitions in Semidefinite Relaxations (a fast and robust algorithm for community detection).*
Invited speaker at the workshop on ‘Statistical Physics of Disordered Systems and Its Applications’ (SPDSA2017). Akiu Resort Hotel Sakan, Sendai, Japan. February 8–9, 2017.
Invited speaker at the workshop on ‘Phase transitions in discrete structures’. Goethe University, Frankfurt. July 25–29, 2016.
Invited speaker at the ‘Kolmogorov meets Turing’ workshop on ‘Stochastics, Optimization, Algorithms, and Games’. LUISS, Rome. May 18, 2016.
Invited speaker at the workshop on ‘Random Instances and Phase Transitions’. Simons Institute for the Theory of Computing, Berkeley, USA. May 4, 2016.

- ANC seminar. Informatics Forum, Edinburgh. February 2, 2016.
- Invited speaker at the International Meeting on High-Dimensional Data Driven Science. Mielparque, Kyoto. December 14–17, 2015.
- *Improved mean-field approximations for inferring marginals and model parameters.*
Invited speaker at the workshop on ‘New Frontiers in Non-equilibrium Physics’. YITP, Kyoto. July 21–24, 2015.
 - *Open questions in the long-time dynamics of glassy systems.*
Invited lecturer at the Netadis Summer Retreat. Bovec (Slovenia). July 5–19, 2015.
 - *Spin glasses in a field.*
Invited speaker at the 113th Statistical Mechanics Conference. Rutgers University, New Jersey. May 10–12, 2015.
 - *Steps to go beyond the Bethe approximation in disordered models: large deviations of critical correlations and loop corrections.*
Invited speaker at the workshop on ‘Critical Phenomena in Random and Complex Systems’. Villa Orlandi, Anacapri. September 9–12, 2014.
 - *A modified kinetic inverse Ising method for the inference of synaptic spatial structure and characteristic times.*
Invited speaker at the workshop on ‘Modelling and inference for dynamics in complex and disordered systems’. NORDITA, Stockholm. June 11–13, 2014.
 - *The analysis of BP guided decimation algorithm.*
Invited speaker at the EPSRC symposium on ‘Statistical Mechanics: Phase transitions in discrete structures and computational problems’. University Warwick, UK. May 5–9, 2014.
 - *A brief introduction to the inverse Ising problem and some algorithms to solve it.*
Golosino seminar. ESPCI, Paris. March 18, 2014.
 - *Mean-field method with correlations determined by linear response.*
Invited speaker at the 99th SIF National Congress. SISSA, Trieste. September 25, 2013.
 - *Making maximum entropy and linear response estimates consistent.*
Invited speaker at the workshop on ‘Statistical Physics of Disordered Systems and Its Applications’ (SPDSA2013). Akiu Resort Hotel Sakan, Sendai, Japan. March 20–21, 2013.
 - *Phase transitions and computational complexity: a physicist point of view.*
Invited speaker at the workshop on ‘Limits of Theorem Proving’. IASI-CNR, Rome. September 25–27, 2012.
 - *Some recent results on the inverse Ising problem.*
Invited speaker at the workshop on ‘Common Concepts in Machine Learning and Statistical Physics’. ICTP, Trieste. August 29–31, 2012.
 - *Adding loops to mean field approximation for disordered models.*
Séminaire du LPTMS, Université Paris Sud, France. April 3, 2012.
 - *Complex stochastic dynamics in spin glasses and optimization problems.*
Invited speaker at the 7th Vienna Central European Seminar on ‘Complex Stochastic Dynamics’. Vienna, Austria. November 26–28, 2010.
 - *Analytic description of an optimization algorithm: Beliefs Inspired Decimation.*
Invited speaker at the workshop on ‘Statistical physics of complexity, optimization and systems biology’. Les Houches, France. March 7–12, 2010.
 - *A glassy phase in the random field Ising model?*
Invited speaker at the workshop on ‘Techniques and Challenges from Statistical Physics’. Centre de Recerca Matemàtica, UAB, Barcelona. October 14–16, 2009.

- *Replica Cluster Variational Method.*
Invited speaker at ‘Physics of Algorithms 2009’ Conference. Santa Fe, New Mexico. August 31 – September 4, 2009.
- *Optimization problems statistical mechanics.*
ISC, CNR, Rome. April 16, 2009.
Mathematics Department, Third University of Rome. March 17, 2009.
Physics Department, Florence University. February 11, 2009.
- *On message guided algorithms for solving constraint satisfaction problems.*
Invited speaker at the workshop on ‘Statistical Mechanics’. Institut Henri Poincaré, Paris. December 8–12, 2008.
- *The (many) phase transitions in random constraint satisfaction problems.*
Invited speaker at the 5th European Conference on Complex Systems. Hebrew University, Jerusalem. September 14–19, 2008.
Invited speaker at the workshop on ‘Phase Transitions, Combinatorial Problems & Message Passing’. BIRS, Banff, Canada. June 8–13, 2008.
Invited speaker at the workshop on ‘Physics of distributed information systems’. NORDITA, Stockholm. May 15–17, 2008.
- *A statistical mechanics approach to optimization problems.*
Invited Lecturer at the 2nd Asian-Pacific School on ‘Statistical Physics and Interdisciplinary Applications’. Beijing. March 3–14, 2008.
Tokyo Institute of Technology, Tokyo. November 1, 2007.
Kyoto University, Kyoto. October 23, 2007.
- *On the solution-space geometry of random constraint satisfaction problems.*
IASI, CNR, Rome. June 16, 2006.
Seminario Interdipartimentale di Algoritmica, Dipartimento di Informatica, Univ. of Rome “La Sapienza”. April 3, 2006.
COSPICO 05, Common trends in statistical physics, information theory, and combinatorial optimization. ECCS’05 satellite meeting. Cité Internationale Universitaire de Paris. November 17, 2005.
- *Optimization and Inference.*
Invited Lecturer at the 1st Latin-American School and Conference on ‘Statistical Physics and Interdisciplinary Applications’. La Havana, Cuba. February 28 – March 12, 2005.
- *Temperature cycle experiments in numerical simulations of spin models.*
Invited speaker at the Workshop on ‘Lengthscales and Heterogeneous Dynamics in Glassy Materials’. New College, Oxford, UK. September 22–25, 2004.
- *Measuring the fluctuation-dissipation ratio with no perturbing field.*
Sphinx General Meeting. Hotel Capoboi, Villasimius, Sardinia. September 14–21, 2003.
- *On the nature of the low-temperature phase in discontinuous mean-field spin glasses.*
Les Houches DYGLAGEMEM/STIPCO Meeting. Les Houches, France. March 3–7, 2003.
- *Alternative solutions to diluted p-spin models and random XORSAT problems.*
Invited speaker at the International Conference on ‘Typical-case Complexity, Randomness and Analysis of Search Algorithms’. ICTP, Trieste. September, 2002.
- *Computational complexity and statistical mechanics.*
Universidad de Extremadura, Badajoz, Spain. April 4, 2002.
- *Unfrustrated models with a glass transition.*
Invited speaker at the International Congress on ‘Unifying Concepts in Glass Physics’. Ac-

Accademia dei Lincei, Roma. February 27 – March 2, 2002.

- *Optimization and statistical mechanics.*
Univ. de La Habana, La Havana, Cuba. January, 2001.
- *Exact solutions for ferromagnetic and spin glass models on diluted hypergraphs.*
Invited speaker at the 2001 General SPHINX Conference. Castelvechio Pascoli, Tuscany. August 29 – September 6, 2001.
- *Numerical simulations of glassy systems in the out-of-equilibrium regime.*
Invited speaker at the IV International Discussion Meeting on ‘Relaxations in Complex Systems’. Heraklion, Crete. June 17–24, 2001.
- *Geometrical properties of LDPC codes.*
Invited speaker at the Workshop on ‘Statistical Physics and Capacity-Approaching Codes’. ICTP, Trieste. May 21–25, 2001.
- *Statistical mechanics of combinatorial optimization problems.*
Invited speaker at VI Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi. Parma. May 29–31, 2001.
Invited speaker at XX Convegno di Fisica Teorica e Struttura della Materia. Fai della Paganella, Trentino. March 25–28, 2001.
- *Chaotic, memory and cooling rate effects in spin glasses: Is the Edwards-Anderson model a good spin glass?.*
Invited speaker at the Fifth Claude Itzykson Meeting on ‘Dynamics of Nonequilibrium Systems’. CEA/Saclay, Paris. June 20–23, 2000.
- *Hyper-SAT: a 3-spin model on a hyper-graph.*
Invited speaker at the Research Workshop on ‘Graph Theory and Statistical Physics’. ICTP, Trieste. May 22–25, 2000.
- *Absence of aging in the remanent magnetization in Migdal-Kadanoff spin glasses.*
Les Houches Sphinx Meeting on ‘Statistical Physics of Glassy and Non-Equilibrium Systems.’ Les Houches, France. January 24–28, 2000.
- *Finite-dimensional spin glasses in the aging regime: replica symmetry breaking and ultrametricity.*
INFMeeting, Catania, Sicily. June 14–18, 1999.
- *Phase transition in a disordered model for the RNA secondary structure.*
Univ. de Barcelona. October 19, 1999.
Univ. Complutense de Madrid. April 14, 1999.
- *Violation of the fluctuation-dissipation relation in spin glasses.*
STATPHYS XX, Paris. July 20–24, 1998.
ICTP, Trieste. March 31, 1998.
- *Evidenze numeriche di rottura spontanea della simmetria di replica nei vetri di spin finitodimensionali.*
Dipartimento di Fisica. Università di Roma “La Sapienza”. November 25, 1997.
- *Simulazioni di un vetro di spin in 4, 6 ed 8 dimensioni.*
Dipartimento di Fisica. Università di Roma “La Sapienza”. April 16, 1997.

Administrative and management experience

from 2012 Member of the *Collegio dei docenti* (Board of faculties) of the Ph.D. school in Physics

at Sapienza University.

from 2011 Member of the Physics Department *Team qualità*, controlling and reporting on the organization and the quality level of the teaching activities.

2012–2018 President of the *Commissione per la pianificazione della didattica* of the Physics Department, coordinating the assignment of teaching duties to all the members of the Physics Department (roughly 150 professors).

2011–2014 Member of the Faculty of Science board (*Commissione spazi*) for the optimization of the use of common areas and lecturing rooms.

2011–2013 Member of the Faculty of Science *Giunta di Facoltà* (restricted board assisting the Faculty Dean).

2008–2012 Person in charge of managing and optimizing the use of the 14 lecturing rooms of the Physics Department.

2004–2008 Member of the Faculty of Science board awarding research grants.

Scientific communication activities

May 15, 2018 Invited speaker to a public science lecture on “I computer e le simulazioni numeriche da Fermi a oggi” (Computers and numerical simulations from Fermi times to nowadays) within the science festival “I mille nomi di Fermi” (The thousand names of Fermi) held at the Physics Department of Sapienza University of Rome.

March 15, 2016 Invited speaker to a *Caffè Scienza* (café scientifique) entitled “Computo ergo sum: simulare il cervello” on recent advances in neural networks and machine learning, held at the ‘asSaggi science bookshop’ in Rome.

May 31, 2015 Invited speaker to a *Caffè Scienza* (café scientifique) entitled “Computo ergo sum” on recent advances in neural networks, held in Matera, Italy.

March 13, 2012 Invited speaker to a *Caffè Scienza* on “Computer and complexity” held at the ‘asSaggi science bookshop’ in Rome.

2007–2011 Co-organizer of a series of *Caffè Scienza* in Rome, roughly one per month.

2010 Author of the journalistic article “Optimizing by Passing Messages” published by Atomium Culture

2006 Author of the entry on “Simulazioni di processi fisici mediante calcolatore” (Computer simulations of physical processes) for the Treccani encyclopedia, the first Italian encyclopedia.

2005 Scientific supervision on the production by Sky Italia (italian broadcast network) of short cartoons explaining some every-day phenomena on a scientific basis.

Complete list of publications

- *Aging rate of spin glasses from simulations matches experiments*,
Janus Collaboration: M. Baity-Jesi, E. Calore, A. Cruz, L.A. Fernandez, J.M. Gil-Narvion, A. Gordillo-Guerrero, D. Iñiguez, A. Maiorano, E. Marinari V. Martin-Mayor, J. Monforte-Garcia, A. Muñoz-Sudupe, D. Navarro, G. Parisi, S. Perez-Gaviro, F. Ricci-Tersenghi, J.J. Ruiz-Lorenzo, S.F. Schifano, B. Seoane, A. Tarancon, R. Tripiccion and D. Yllanes,
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- *One-loop topological expansion for spin glasses in the large connectivity limit*,

- M.C. Angelini, G. Parisi and F. Ricci-Tersenghi,
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- *Dynamic variational study of chaos: spin glasses in three dimensions*,
A. Billoire, L.A. Fernandez, A. Maiorano, E. Marinari, V. Martin-Mayor, J. Moreno-Gordo,
G. Parisi, F. Ricci-Tersenghi and J.J. Ruiz-Lorenzo,
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 - *An improved Belief Propagation algorithm finds many Bethe states in the random field Ising model on random graphs*,
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 - *Comparison of Gabay-Toulouse and de Almeida-Thouless instabilities for the spin glass XY model in a field on sparse random graphs*,
C. Lupo and F. Ricci-Tersenghi,
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 - *Loop expansion around the Bethe approximation through the M-layer construction*,
A. Altieri, M.C. Angelini, C. Lucibello, G. Parisi, F. Ricci-Tersenghi and T. Rizzo,
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 - *Numerical construction of the Aizenman-Wehr metastate*,
A. Billoire, L.A. Fernandez, A. Maiorano, E. Marinari, V. Martin-Mayor, J. Moreno-Gordo,
G. Parisi, F. Ricci-Tersenghi and J.J. Ruiz-Lorenzo,
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 - *Matching Microscopic and Macroscopic Responses in Glasses*,
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A. Gordillo-Guerrero, D. Iñiguez, A. Maiorano, E. Marinari V. Martin-Mayor, J. Monforte-Garcia, A. Muñoz-Sudupe, D. Navarro, G. Parisi, S. Perez-Gaviro, F. Ricci-Tersenghi, J.J. Ruiz-Lorenzo, S.F. Schifano, B. Seoane, A. Tarancon, R. Tripiccion and D. Yllanes,
Phys. Rev. Lett. **118**, 157202 (2017).
 - *Gauge-free cluster variational method by maximal messages and moment matching*,
E. Dominguez, A. Lage-Castellanos, R. Mulet and F. Ricci-Tersenghi,
Phys. Rev. E **95**, 043308 (2017).
 - *Improving variational methods via pairwise linear response identities*,
J. Raymond and F. Ricci-Tersenghi,
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 - *Approximating the XY model on a random graph with a q-states clock model*,
C. Lupo and F. Ricci-Tersenghi,
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 - *A simple analytical description of the non-stationary dynamics in Ising spin systems*,
E. Dominguez, G. Del Ferraro and F. Ricci-Tersenghi,
J. Stat. Mech. 033303 (2017).
 - *A statics-dynamics equivalence through the fluctuationdissipation ratio provides a window into the spin-glass phase from nonequilibrium measurements*,
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- *The Backtracking Survey Propagation Algorithm for Solving Random K-SAT Problems*,
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- *Data quality for the inverse Ising problem*,
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- *Performance of a community detection algorithm based on semidefinite programming*,
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