

Maria Chiara Angelini

Dipartimento di Fisica, ed. Marconi, Sapienza Università di Roma, Piazzale Aldo Moro 5, 00185 Roma

Personal data

Phone: +39 3403844791

Email: maria.chiara.angelini@roma1.infn.it

Permanent address: via delle cave di Pietralata 21, 00157 Roma, Italy

Date of birth: 08/12/1985

Married, three children

Education

Ph.D. Physics, Università “Sapienza”, Roma, Received February 07, 2013

Title: Renormalization group and critical properties of Long Range models

Supervisor: F. Ricci-Tersenghi

September 2009, Ranked first at the admission test for the Ph.D program at Università “Sapienza”, Roma.

Laurea specialistica (Master’s Degree), Physics, Università “Sapienza”, Roma, 110/110 e lode
24 September 2009

Title: Entropic effects in the SG transition at null temperature

Supervisor: F. Ricci-Tersenghi

Graduate studies with an average mark of 29.81/30.

Laurea triennale (Bachelor’s Degree), Physics, Università “Sapienza”, Roma, 110/110 e lode
3 October 2007

Title: Optimized Monte Carlo methods

Supervisor: V. Marinari

Graduate studies with an average mark of 29.69/30.

Fields of Research Interest

Statistical mechanics, disordered systems, renormalization group, inference and optimization problems.

List of publications

G Gradenigo, M.C.A., L Leuzzi, F Ricci-Tersenghi, *Solving the fully-connected spherical-spin model with the cavity method: equivalence with the replica results*, J. Stat. Mech. 113302 (2020).

M.C.A., G. Parisi and F. Ricci-Tersenghi, *Comment on ‘Real-space renormalization-group methods for hierarchical spin glasses’*, J. Phys. A: Math. Theor. **53** 418001 (2020).

M.C.A., C. Lucibello, G. Parisi, F. Ricci-Tersenghi, T. Rizzo, *New loop expansion for the Random Magnetic Field Ising Ferromagnets at zero temperature*, PNAS **117**, 2268-2274 (2020).

M.C.A., F. Ricci-Tersenghi, *Monte Carlo algorithms are very effective in finding the largest independent set in sparse random graphs*, Phys. Rev. E. 100, 013302 (2019).

- M. C. A., *Parallel Tempering for the planted clique problem*, J. Stat. Mech. (2018) 073404.
- M.C.A., G. Parisi, F. Ricci-Tersenghi, *One-loop topological expansion for spin glasses in the large connectivity limit*, EPL (Europhysics Letters) 121 (2), 27001 (2018).
- A. Altieri, M.C.A., C. Lucibello, G. Parisi, F. Ricci-Tersenghi, T. Rizzo, *Loop expansion around the Bethe approximation through the M-layer construction*, J. Stat. Mech. (2017) 113303.
- M.C.A., Giulio Biroli, *Real Space Migdal-Kadanoff Renormalisation of Glassy Systems: Recent Results and a Critical Assessment*, Journal of Statistical Physics, 1-23 (2017).
- M.C.A., Giulio Biroli, *Real space renormalization group theory of disordered models of glasses*, Proceedings of the National Academy of Sciences, 114 (13), 3328 (2017).
- M.C.A., F. Caltagirone, F. Krzakala, L. Zdeborova, *Spectral Detection on Sparse Hypergraphs*, Proc. 53th Annual Allerton Conference on Communication, Control, and Computing (2015).
- F. Krzakala, L. Zdeborova, M.C.A., F. Caltagirone, *Statistical Physics of Inference and Bayesian Estimation*, <http://indico.ictp.it/event/a14244/material/10/0.pdf>
- M.C.A. , Giulio Biroli, *Spin Glass in a Field: a New Zero-Temperature Fixed Point in Finite Dimensions*, Phys. Rev. Lett. 114, 095701 (2015).
- M.C.A. , Giulio Biroli, *The Super-Potts glass: a new disordered model for glass-forming liquids*, Phys. Rev. B 90, 220201(R) (2014).
- M.C.A., G. Parisi and F. Ricci-Tersenghi, *Relations between Short Range and Long Range Ising models*, Phys. Rev. E 89, 062120 (2014).
- M.C.A., Ph.D. Thesis, *Renormalization group and critical properties of Long Range models*, <http://hdl.handle.net/10805/2105> (2013).
- M.C.A., G. Parisi and F. Ricci-Tersenghi, *Ensemble Renormalization Group for Disordered Systems*, Phys. Rev. B 87, 134201 (2013).
- M.C.A., F. Ricci-Tersenghi, Y. Kabashima, *Compressed sensing with sparse, structured matrices*, Proc. Fiftieth Annual Allerton Conference on Communication, Control, and Computing, p. 808 (2012).
- M.C.A. and F. Ricci-Tersenghi, *Entropic long range order in a 3D spin glass model*, J. Stat. Mech. P02002 (2011).

Research Experience

September 2018 – Today: Temporary Assistant Professor (RTDA), Physics Department, Università "Sapienza", Roma.

October 2014 – September 2018: Temporary Research Fellowship, Physics Department, Università "Sapienza", Roma.

November 2012 – October 2014: Temporary Research Fellowship, "Statistical Physics of glass transition and renormalization group theory", Institut de Physique Théorique Orme des Merisiers, CEA/Saclay (France).

Maternity leave periods:

February 2015 – July 2015

November 2016 – April 2017

December 2019 – May 2020

Referee Activity

Referee for Physical Review Letters, Physical Review B, Physical Review E, Journal of Statistical Physics, Journal of Statistical Mechanics, Europhysics Letters, Physica A, Digital Signal Processing.

Teaching Experience

2020-2021: co-Teacher, *Laboratorio di Fisica Computazionale* (6 CFU), LT Fisica, Università "Sapienza", Roma.

2019-2020: co-Teacher, *Laboratorio di Fisica Computazionale* (6 CFU), LT Fisica, Università "Sapienza", Roma.

2019-2020: Teacher, *mini-corso Metodi MonteCarlo*, Percorsi di eccellenza, LT Fisica, Università "Sapienza", Roma.

2018-2019: Teacher, *mini-corso Metodi MonteCarlo*, Percorsi di eccellenza, LT Fisica, Università "Sapienza", Roma.

2018-2019: Teacher, *Laboratorio di Fisica Computazionale* (6 CFU), LT Fisica, Università "Sapienza", Roma.

2017-2018: Teaching assistant, *Laboratorio di Fisica Computazionale*, LT Fisica, Università "Sapienza", Roma.

2015-2016: Teaching assistant, *Laboratorio di Fisica Computazionale*, LT Fisica, Università "Sapienza", Roma.

2011-2012: Teaching assistant, *Laboratorio di Fisica Computazionale*, LT Fisica, Università "Sapienza", Roma.

2010-2011: Teaching assistant, *Meccanica*, LT Chimica, Università "Sapienza", Roma.

I followed Ada Altieri during its Ph.D. and Francesco Arceri during its master thesis, I was supervisor of 5 undergraduate (B.Sc.) thesis in Physics.

Qualifications

2020 Abilitazione Scientifica Nazionale (national scientific qualification) to Assistant Professor in Mathematical Physics (SC 01/A4).

Conference and Seminar Presentations

New loop expansion around the Bethe approximation and its application to disordered models.

11 September 2019, invited talk, "40 years of Replica Symmetry Breaking (RSB40)", Rome.

Real space Renormalization Group for Spin-Glasses: Migdal-Kadanoff vs Topological expansion

26 July 2016, invited talk, "Renormalisation Group Theory of Disordered Systems", satellite meeting of STATPHYS26, Paris.

Real Space Renormalization Group Theory of spin glasses and disordered Models of Glasses

22 July 2016, contributed talk, StatPhys26, Lyon.

Spin Glass in a Field: a surprising New Zero-Temperature Fixed Point in Finite Dimensions

1 December 2014, invited talk, IPhT, CEA, Saclay.

Relations between Short Range and Long Range Ising models

28 April 2014, invited talk, IPhT, CEA, Saclay.

Looking for a disordered model of finite dimensional glasses

31 January 2014, "Rencontre de Physique Statistique", Paris.

25 September 2013, invited talk to "XCIX Congresso Nazionale Societa' Italiana di Fisica", Trieste.

Ensemble Renormalization Group for Disordered Systems

30 March 2012, invited talk to "Rejuvenating Concepts in Glass Physics", Paris.

23 February 2012, "On the Bridge between Statistical physics and Optimization, Inference and Learning", Les Houches workshop.

7 February 2012, ICTP, Trieste

24 October 2011, Tokyo Institute of Technology, Yokohama

Entropic long range order in a 3D spin glass model

18 February 2011, "Statistical physics of complexity, optimization, and systems biology", Torino-Bardonecchia (Italy)

Grants and projects

2019-2022 PI of the research project on "Gruppo di rinormalizzazione attorno alla soluzione di Bethe per Random Field Ising Model e Spin Glass in campo." funded by Sapienza University of Rome with €4,000.

2016 PI of the research project on "Modelli disordinati: connessioni e differenze con la fisica dei vetri" funded by Sapienza University of Rome with €2,780.

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

Last updated: December 10, 2020

