Marc Mézard - Curriculum vitae, May 2024

Full Professor, Bocconi University
marc.mezard@unibocconi.it
Born : August 29, 1957

Education
Studies at École normale supérieure (Paris), 1976-1980. Degrees:

-Master in Physics 1978

-Thèse 3eme cycle in Theoretical Physics 1980

-*Agrégation* teaching degree in Physical Sciences 1980

-Thèse Etat 1984: "Study of the mean field theory of spin glasses and its physical interpretation", supervisor C. Bouchiat.

Appointments
Professor, Bocconi University	2022-present
Director, École Normale Supérieure (Paris)	2012-2022
Research Director (*classe exceptionnelle*), CNRS	2010-2022
Director of LPTMS, Université Paris Sud	2010-2012
Visiting Scientist, Oldenburg University	2009-2010
Research Director (*1re classe*), CNRS, Université Paris Sud	1999-2010
Part-time professor, Ecole Polytechnique	1987-2012
Visiting Scientist, KITP, Santa Barbara	1998-1999
Research Director, CNRS, Laboratoire de Physique Théorique ENS	1989-1998
Postdoctoral fellow, Rome University La Sapienza	1984-1986
Junior Researcher, CNRS, Laboratoire de Physique Théorique ENS	1981-1989
Assistant Professor (*agrégé préparateur*) at École normale supérieure	1980-1981

Distinctions
2023: Election to the Accademia dei Lincei

2022: « Prix des trois physiciens »

2016 : Onsager Prize of the American Physical Society (with G. Parisi and R. Zecchina)

2013 : Chevalier de la Légion d'honneur

2012 : Elected to the European Academy of Sciences

2009 : Humboldt Gay-Lussac Prize of the Humboldt Foundation (Germany)

1996 : Prize « Ampère » of the French Academy of Sciences (with C. De Dominicis)

1990 : Silver medal of CNRS

1988 : Prize « Suzanne et Anatole Abragam » of the French Academy of Sciences

1985 : Bronze medal of CNRS

Selected lectures
07/2023: 29th Solvay Conference on Physics, « The structure and dynamics of disordered systems », co-chair with D.J. Gross and G. Parisi

07/2023 : Plenary lecture, Condensed Matter Joint Conference, European Physics Society, Milano

07/2023 : Plenary panel, French Physical Society 150 Years

04/2023 : Plenary lecture, Israel Physical Society Yearly meeting

01/2020 : Turing Lectures, ICTS Bangalore

01/2020 : Salam Lectures, ICTP Trieste
01/2018 : Bernoulli lecture, EPFL Lausanne
11/2015 : Boole-Shannon Lecture, MIT
05/2014 : Loeb Lectures, Harvard University
06/2013 : Simons Institute for the Theory of Computing (Berkeley), inaugural conf., invited lecture
10/2004 : Plenary lecture, Information Theory Workshop (San Antonio)
12/2003 : Plenary lecture, NIPS conference (Vancouver)
07/2002 : Plenary lecture, STATPHYS conference (Cancun)
07/1997 : Plenary lecture, International Conference of Mathematical Physics (Brisbane)

In the last 25 years, around 150 invited lectures at international conferences and many « colloquia » in top Universities, among which Princeton, Chicago, Stanford, Berkeley, Rome, UC Santa Barbara, Geneva, KTH Stockholm, Göttingen, IBM Yorktowns, King's College, Oxford, ICTP Trieste, ENS, CUNY, Helsinki, ENS-Lyon, UC Santa Cruz, TU München, Barcelona, CEA Saclay, UC San Diego, Rutgers, Torino, EPFL, Bangalore, NYU.

Teaching
Full Professor at Bocconi University, 2021-present. Courses taught:
- Fundamentals of Physics (First Year Undergraduate « BAI »), 2021-2022
- Quantum and Statistical Physics (Third Year Undergraduate « BAI »): 2022-present
- Statistical Mechanics and Methods for Complex Systems (PhD course): 2022-present

Part-time associate professor at Ecole Polytechnique from 1987 to 2003. Courses taught:
- Quantum mechanics
- Statistical physics
- Symmetries in quantum physics and condensed matter physics

Part-time full professor at Ecole Polytechnique from 2003 to 2012
- Statistical physics
- Statistical Field Theory
- Statistical physics of complex systems
- Occasional Graduate and Post-Graduate courses at several summer schools, including

6 long series of courses at Beg-Rohu summer school (last ones in 2011, 2018, 2023)

Books
1987 : « *Spin glass theory and beyond* », M. Mézard, G. Parisi and M.-A. Virasoro, World Scientific
2009 : « *Information, Physics and Computation* », M. Mézard and A. Montanari, Oxford Univ.Press

Book chapters
"Out of equilibrium dynamics in spin-glasses and other glassy systems",
J.-P. Bouchaud, L.F. Cugliandolo, J. Kurchan and M. Mézard, in *Spin glasses and Random fields*, A.P. Young ed., World Scientific (1997).

``First steps in Glass Theory", M. Mézard, in *More is different*, N.P. Ong and R.N. Bhatt eds., Princeton University Press (2001).

``Theory of random solid states'', Marc Mézard, in *Stealing the Gold; a celebration of the pioneering physics of Sam Edwards*, Paul M. Goldbart, N. Goldenfeld and D. Sherrington eds. Clarendon Press, Oxford 2004.

``Glasses and replicas'', Marc Mézard and Giorgio Parisi, in *Structural Glasses and Supercooled Liquids: Theory, Experiment, and Applications*, V. Lubchenko and P. Wolynes eds, Wiley 2012.

``Spin glass Theory and Far Beyond », P. Charbonneau, E. Marinari, M. Mézard, G. Parisi, F. Ricci-Tersenghi, G. Siccuro, F. Zamponi eds. World Scientific 2023.

Selected Publications

- *On the nature of the spin glass phase*, Mézard, Parisi, Sourlas, Toulouse, Virasoro, Phys. Rev. Lett. 52 (1984) 1156
- *The simplest spin glass*, D. Gross and M. Mézard, Nucl. Phys. B240 [FS12] (1984) 431.
- *Replicas and optimization*, M. Mézard and G. Parisi, J. Physique Lett. 46 (1985) L771
- *SK model : the replica solution without replicas*, M. Mézard, G. Parisi and M.A. Virasoro, Europhys. Lett. 1 (1985) 77.
- *Learning in feedforward layered networks: the tiling algorithm*, M. Mézard and J.P. Nadal, J.Physics A22 (1989) 2191.
- *Replica field theory for random manifolds*, M. Mézard and G. Parisi, J. Phys. I 1 (1991) 809.
- *Thermodynamics of glasses: a first principle computation*, M. Mézard and G. Parisi, J. Phys. Condens. Matter 11 (1999) A157-A165.
- *Wealth condensation in a simple model of economy*, J.-P. Bouchaud and M. Mézard, Physica A, 282, 536 (2000).
- *The Bethe lattice spin glass revisited*, M. Mézard and G. Parisi, Eur. Phys. J. B 20 (2001) 217
- *Analytic and Algorithmic Solution of Random Satisfiability Problems*, M. Mézard, G. Parisi, R. Zecchina, Science 297 (2002) 812
- *The random K-satisfiability problem: from an analytic solution to an efficient algorithm,* Marc Mézard, Riccardo Zecchina, Phys. Rev. E 66 (2002) 056126.
- *Lattice Glass Models*, G.Biroli and M. Mézard, Phys. Rev. Lett. 88 (2002) 025501.
- *Statistical properties of stock order books: empirical results and models,* J.-P. Bouchaud, M. Mézard and M. Potters, Quantitative Finance 2 (2002) 251
- *Survey propagation: an algorithm for satisfiability*, A. Braunstein, M. Mézard, R. Zecchina, Random Structures and Algorithms 27 (2005) 201-226
- *Clustering of solutions in the random satisfiability problem*, M. Mézard, T. Mora, R. Zecchina, Phys. Rev. Lett. 94 (2005) 197205
- *Reconstruction on trees and spin glass transition*, Marc Mézard, Andrea Montanari, J. Stat. Phys. 124 (2006) 1317-1350
- *Statistical physics-based reconstruction in compressed sensing,* Florent Krzakala, Marc Mézard, Francois Sausset, Yifan Sun and Lenka Zdeborova, Phys. Rev. X 2 (2012) 021005
- *Belief Propagation Reconstruction for Discrete Tomography*, Emmanuelle Gouillart, Florent Krzakala, Marc Mézard, Lenka Zdeborova, Inverse Problems 29, 3 (2013) 035003.
- *Modeling the influence of data structure on learning in neural networks: the hidden manifold model*, Sebastian Goldt, Marc Mézard, Florent Krzakala, Lenka Zdeborová, Phys. Rev. X 10 (2020)
- *Epidemic mitigation by statistical inference from contact tracing data*, Antoine Baker et al., arXiv:2009.09422, PNAS, July 2021
- *The exponential capacity of dense associative memories,* C Lucibello and Marc Mézard, Phys.Rev.Lett. 132.077301, 2024

- *Generative Diffusion in very large dimensions,* G. Biroli and Marc Mézard, J. Stat. Mech. 2023, 093402

Administrative Responsibilities, Boards and Grants

- Director, École normale supérieure - PSL University, (2012-2022).
- Acting President of PSL University, 2017.
- Director, Laboratoire de Physique Théorique et Modèles Statistiques (LPTMS), Université Paris Sud (2010-2012).
- Board member, PSL University (2012-2022)
- Board member, Ecole normale supérieure de Lyon (2012-2022)
- Board member, Paris School of Economics (2012-2022)
- Board member, Foundation « La main à la pâte » (2012-2022)
- Board member, Foundation CFM (Capital Fund Management) (2014-present)
- Creator and 1st Director, Excellency laboratory « PALM » (Physics : Atoms Light Matter), involving 700 physicists in Saclay (2011-2012)
- Leader, ANR Grant « QuDEC » on Quantum decoherence (2012)
- Participant, ANR Grant « QPPRJCCQ » lead by B. Douçot on Quantum Computing (2010)
- Participant, ANR Grant ``UNLOC'' lead by D. Simon on Constraint Satisfaction Problems (2009)
- Principal coordinator of a European ``Research training network » of 10 European laboratories (2002-2006)
- Principal coordinator of a European ``Human Capital and Mobility » network of 13 European laboratories (1993-1997)
- Chief Scientific Director, « *Journal of Statistical Mechanics: Theory and Experiment (JSTAT)* » 2009-present
- Previously editor of *Europhysics Letters, Physica A, International Journal of Neural Networks, Complexus, Journal of Statistical Physics*
- Seminar organizer, LPTMS Orsay 2000-2007
- Co-Organizer, Les Houches Summer School on « Complex systems », 2006
- Scientific board of ICTP (Trieste) (2021- present)
- Board of trustees of the Cyprus Research and Educational Foundation (2022-present)
- Co-Organizer, Les Houches Workshop on « Recent advances in understanding artificial and biological neural networks », 2023

*PhD supervised (14)***:** W. Krauth, R. Monasson, I. Kocher, A. Hazareesing, A. Barrat, M. Müller, M. Ratieville, O. Rivoire, T. Mora, L. Zdeborova, M. Castellana, J. Sakellariou, A. Lokhov, F Camilli