

CURRICULUM VITAE

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EDUCATION

- 9/81 - 7/86 Doctorate of Philosophy (Ph.D.) in Physics at Boston University (Boston, USA) with Prof. Sidney Redner. Thesis in Statistical Mechanics: "Multifractality in Percolation: the Voltage Distribution".
- 11/74 - 3/80 Laurea in Fisica (Master of Science in Physics) Summa cum Laude at the University of Napoli with Prof. Giuseppe Iadonisi. Thesis in Theoretical Solid State Physics: "Theory of Surface Plasmons".

EMPLOYMENT

- 11/14 - present Full Professor of Theoretical Physics of Condensed Matter, Department of Industrial and Information Engineering, Second University of Naples.
- 11/01 - 10/14 Associate Professor of Theoretical Physics at the Department of Industrial and Information Engineering of the Second University of Naples.
- 11/96 - 10/01 Associate Professor of General Physics at the Department of Information Engineering of the Second University of Naples (Italy).
- 11/93 - 10/96 Associate Professor of Theoretical Physics at the Physics Department of the University of L'Aquila (Italy).
- 10/90 - 10/93 CNRS research position (CR1) at the L.P.M.M.H. of the E.S.P.C.I., Paris (France).
- 7/89 - 6/90 Visiting scientist at the Service de Physique Théorique, CEN, Saclay (France).
- 6/89 Visiting scientist at the HLRZ (Hochleistungsrechenzentrum), Kernforschungsanlage (KFA), Jülich (FRG).
- 6/87 - 5/89 Visiting scientist at the Centre d'Etudes Nucléaires, Saclay (France) with a fellowship of the European Community.
- 11/86 - 4/87 Post-Doctoral position at the University of Cologne, Köln (FRG) with Prof. Dietrich Stauffer.
- 9/81 - 7/86 Research and Teaching Assistant at Boston University, in the Center for Polymer Studies.

LEAVE

- 24/11/14-
12/12/2014 Invited scientist at the Kavli Institute for Theoretical Physics at the University of Santa Barbara.
- 1/3/13 - 31/5/13 Visiting Professor at the Institute "Computational Physics for Engineering Materials", ETH Zurich (CH).
- 11/1/08 -
10/31/09 Sabbatical year at the Institute "Computational Physics for Engineering Materials", ETH Zurich (CH).
- 1/1/09 - 6/30/09 Senior scientist fellowship of the Ville de Paris at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).
- 6/08 Visiting Professor (Chaire Joliot) at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).
- 1/08 Visiting Professor (Chaire Paris Sciences) at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).

1/07	Visiting Professor (Chaire Joliot) at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).
9/03	Visiting Professor (Chaire Joliot) at the Laboratory L.P.M.M.H., E.S.P.C.I., Paris (France).
1/88 - 2/88	Visiting scientist at the Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro (Brasil) with a joint exchange program CNR (Italy) and CNPq (Brasil).

TEACHING EXPERIENCE

2013/14- present	Professor of General Physics 1 (14 credits) for BS in Electronic and Information Engineering (SUN).
2010/11- present	Professor of 3 cfu for the Statistical Mechanics course (8cfu), Master in Physics, University of Naples Federico II.
2006/07-2012/13	Professor of General Physics 1 (12 credits) for BS in Aerospace, Electronic and Information Engineering (SUN).
A.A. 2012/13	Professor of the course "Correlations in time series of stochastic natural phenomena", for the Master in Civil Engineering, Doctoral Department of Civil, Environmental and Geomatic Engineering and the Physics Master, ETH Zurich.
2003/04-2005/06	Professor of Fundamentals of Mathematics and Physics (10cr.) and General Physics (5cr.) for BS in Aerospace and Mechanical Engineering; Professor of Condensed Matter Physics (5cr.) for MS in Electronic Engineering (SUN).
XXI, XXIII cycles	Professor of "Statistical models for seismology and fracture" for the Graduate school in Seismic Risk at the University of Naples Federico II.
XXIII cycle- present	Member of the Teaching Committee for the Graduate School in Physical Sciences of Matter at the University Roma Tre (Rome, Italy).
XVI, XXII cycles	Member of the Teaching Committee for the Graduate School in Seismic Risk at the University of Naples Federico II.
2001/02-2002/03	Professor of General Physics (60h) for BS in Aerospace, Civil, Mechanical and Environmental Engineering (SUN).
XIV, XV, XVIII cycles	Professor of "Statistical models for the fracture of heterogeneous media" for the Graduate school in Fundamental and Applied Physics at the University of Naples Federico II.
2000/01	Professor of two courses of General Physics (60h) for BS in Aerospace, Civil, Electronic, Mechanical and Environmental Engineering (SUN).
1997/98-99/2000	Professor of General Physics 1 (90h) for BS in Electronic and Mechanical Engineering (SUN).
1996/97	Professor of General Physics 1 for BS (90h) in Electronic Engineering (SUN); Professor of Statistical Mechanics (60h) for BS in Physics at the University of L'Aquila.
1995/96	Professor of General Physics 1 (90h) for BS in Environmental Sciences; Professor of Statistical Mechanics for BS (60h) in Physics at the University of L'Aquila. Professor of General Physics 1 (90h) for BS in Electronic Engineering at The Second University of Naples.
1994/95	Professor of General Physics 1 (90h) for BS in Environmental Sciences; Professor of Statistical Mechanics for BS (60h) in Physics at the University of L'Aquila.
1993/94	Professor of General Physics 1 (90h) for BS in Environmental Sciences at the University of L'Aquila.
9/81 - 5/86	Teaching Assistant at the Physics Department of the Boston University.

SCIENTIFIC SUPERVISION

Graduate students:

In France, Claude Ghidaglia (1990-1993) employed at CEA, Horacio Colina (1990-1993) employed at ATILH.

In Italy, Emanuela Del Gado (1997-2000), SNF Professor at ETH Zurich.

At ETH Zuerich, Fabrizio Lombardi (2011-14), Laurens van Kessenich (2015-), Damian Berger (2015-).

Undergraduate:

Emanuela Del Gado (1996), Gianluca Pellegrini (2007), Fabrizio Lombardi (2010), Vittorio Capano (2012), Roberta Russo (2013), Giovanni Di Meglio (2013), Vittorio Capano (2015), Emanuele Varriale (2017).

Post-doc:

Giancarlo Franzese (2001) Professor at the University of Barcelona, Eugenio Lippiello (2006-2008) Assistant Professor at SUN, Massimo Pica Ciamarra (2007-2009) CNR Researcher and Professor University of Singapore, Luigi Saggese (2012-13).

HONORS

Starting 2018 Secretary of the Commission C3 of the IUPAP.

Since 2015 member of the Commission C3 of the IUPAP.

January - June 2009 Senior Researcher fellowship (6 months) founded by the Ville de Paris.

June 2008, Chaire Joliot at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).

January 2008, Chaire Paris Sciences at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).

January 2007, Chaire Joliot at the Laboratoire de Physique Thermique, E.S.P.C.I., Paris (France).

September 2003, Chaire Joliot at the laboratory L.P.M.M.H., E.S.P.C.I., Paris (France).

ACADEMIC CHARGES

- February 2014-2018 Member of the Committee of the Polytechnical School of the SUN.
- During the academic years 2012/13–2016/17 responsible of the project "Foster a high school".
- Since 2013 responsible of the Educational Guidance activities (*ex-ante, in itinere and ex-post*) for the Department of Industrial and Information Engineering.
- From 11/2013 to 2/2018 member of the Executive Committee of the Department of Industrial and Information Engineering.
- From 11/ 2010 to 12/2012 member of the Executive Committee of the Department of Information Engineering.
- Member of the evaluation committee for parallel computing projects of INFM in 2007 and 2008.
- Responsible of the project for a Graduate School in Science of Condensed Matter involving the 36 Italian Universities associated in CNISM and the CNR. The project has been approved and the Graduate School has started in 2007.
- From 2005 to 2008, delegate of the Second University of Naples to the Convention of Representatives of CNISM (Consorzio Nazionale Interuniversitario per la Scienza della Materia).
- From 22/2/01 to 31/5/05, Director of the INFM (National Institute of Condensed Matter) Group of the Second University of Naples.
- July 2004 Member of the CAR, evaluation committee of the Physics Area on behalf of the Ministry of University (MIUR), at the Second University of Naples.
- From 2002 to 2006, Member of the Executive committee Of the Regional Center of Competence "Analysis and Monitoring of the Environmental Risk". Responsible of the Center Section "Modeling", member of the Center scientific committee. Delegate INFM in the Center Administrative committee. Responsible of the "Modeling" Laboratory provided of a Cluster Beowulf for parallel computing (99 dual processors 2.8Mhz with Myrinet acquired with a EEC grant of 630000 euros).
- From 2001 to 2002, Delegate INFM to participate to the Planning committee of the Regional Center of Competence "Analysis and Monitoring of the Environmental Risk". Reference person for the Section Seismic Risk.
- 1999-2002, Member of the Executive committee of the Information Engineering Department of the Second University of Naples.
- 1995-96, Member of the Scientific committee of the Physics Department of the University of L'Aquila.

QUALIFICATIONS

- Qualification to Full Professor in Italian Universities (ASN) in the area 02/A2 (FIS02) "Theoretical Physics of Fundamental Interactions". Campaign 2012 (validity from 23/01/2017 to 23/01/2023).
- Qualification to Professor position in French Universities for the Section 28 (Milieux denses et matériaux), Campaign 2011.
- Qualification to Professor position in French Universities for the Section 29 (Constituants élémentaires), Campaign 2011.
- Qualification to Professor position in French Universities for the Section 30 (Milieux dilués et optique), Campaign 2011.

HIRING COMMITTEES

- Member of the evaluation committee for a Professor position in Computational Mechanics at the Department of Engineering, ETH Zurich (CH).

- Member of the evaluation committee for a Professor position in computational physics (code NT 74/15) at the Department of Physics, Norwegian University of Science and Technology in Trondheim (April 2016).
- Member of the evaluation committee for 1 full professor position in Theoretical Physics of Condensed Matter (AC 02/B2, SSD FIS/03) at the Physics Department of the University of Milan (Italy), (March 2016).
- Member of the evaluation committee for a Professor position in computational physics (code NT1120) at the Department of Physics, Norwegian University of Science and Technology in Trondheim (August 2011).
- Member of the evaluation committee for 1 assistant professor position in Theoretical Physics at the Faculty of Science of the University of Padova (Italy), (II Session 2007).
- Member of the evaluation committee for Tenure Track positions CNR-INFM, Genova (Italy), July 2008.
- Member of the evaluation committee to hire 1 associate professor of Theoretical Physics at the Faculty of Science of the University of Salerno (Italy), (I Session 2006).
- July 2006, Member of the evaluation committee to hire 15 CNISM Researcher positions (Call N. 1).
- May 2004 Member of the evaluation committee to hire 1 Senior Researcher and 4 Researchers INFM (Call N. 882) at the Research Center "Statistical Mechanics and Complexity", INFM Rome (Italy).
- 23/6/03 Member of the evaluation committee to hire 1 Researcher INFM, Section G (Call N. 801).
- 28/2/03 Member of the evaluation committee to hire 1 Researcher INFM, Naples (Call N. 705).
- 26/10/01 Member of the evaluation committee for 4 post doc positions INFM (Call N. 538) at the Research Center "Statistical Mechanics and Complexity", INFM Rome (Italy).
- Member of the evaluation committee to hire 1 X level position for the General Coordinator of the Data processing Center of the Second University of Naples (Call 24/3/00).
- Member of the evaluation committee for 4 post doc positions, area B01A/B03X, at the Department of Information Engineering of the Second University of Naples.

GRANTS AND RESEARCH PROJECTS

- Coordinator for the Second University of Naples of the project PRIN (Programmi di ricerca di interesse nazionale) 1997-99: "Static and dynamic properties of the sol-gel transition", funded by the Italian Ministry of University MIUR. National Coordinator Prof. Antonio Coniglio (University of Naples "Federico II").
- Coordinator for the Second University of Naples of the project PRIN (Programmi di ricerca di interesse nazionale) 2000-02: "Dynamics and glassy behaviour of the sol-gel transition", funded by the Italian Ministry of University MIUR. National Coordinator Prof. Antonio Coniglio (University of Naples "Federico II").
- Principal coordinator INFM for the project of Regional Center of Competence "Analysis and Monitoring of Environmental Risk", funded by European Community (Measure 3.16), funding obtained 930000 euro.
- Coordinator for the Second University of Naples of the project PRIN (Programmi di ricerca di interesse nazionale) 2002-04: "Gelation phenomena and jamming transition", funded by the Italian Ministry of University MIUR. National Coordinator Prof. Antonio Coniglio (University of Naples "Federico II").
- Coordinator for the Second University of Naples of the project PRIN (Programmi di ricerca di interesse nazionale) 2004-06: "Scaling behaviour and complex dynamics in polymer systems", funded by the Italian Ministry of University MIUR. National Coordinator Prof. Antonio Coniglio (University of Naples "Federico II").
- Coordinator for the Second University of Naples of the project PRIN (Programmi di ricerca di interesse nazionale) 2009: "Unjamming dynamics in sheared granular media: the micro-mechanical and statistical properties of a seismic fault model" funded by the Italian Ministry of University MIUR. National Coordinator Dott. Antonio De Candia (University of Naples "Federico II").

RESEARCH INTERESTS

Condensed matter Physics: critical phenomena, disordered systems, fractals; percolation, multifractality in percolation and in growth phenomena; hydrodynamic dispersion; droplet model and dynamical properties in Ising and Potts models.

Cellular Automata: Kauffman model, damage spreading, introduction of noise; dynamical transition in the Ising model and in spin glasses.

Statistical mechanics models for the fracture of heterogeneous media: lattice simulations and scaling laws.

Lattice models for the deep bed filtration at low Reynolds numbers.

Viscoelastic and relaxation properties at the sol-gel transition in chemical and physical gels. Glassy behaviour in colloidal gels. Kinetics of bond formation in cross-linked gelatine gels.

Stochastic phenomena: Self-Organized Criticality models with memory applied to seismic occurrence. Branching models with dynamical scaling for seismic forecasting. Magnitude correlations between seismic events. Solar flares, modelling and analysis of correlations.

Neuronal networks with synaptic plasticity for avalanche activity, signal power spectrum, waiting time distribution, on regular, small world and scale free networks. Electro-physiological and fMRI data analysis. Performance in complex learning.

Large scale computer simulations, working experience in parallel and vectorial computing. Redaction of the project and realization of a 99 dual-processors cluster in Myrinet (630000 euro value) with EEC funding.

REFeree ACTIVITY

Member of the Advisory Editorial Board of *Physica A* and *Frontiers in Fractal Physiology*.

Reviewer for NSF grants and ISCRA (Italian Super-Computing Resource Allocation) at CINECA.

Referee for PNAS, *Physical Review Letters*, *Physical Review E*, *Journal of Chemical Physics*, *Europhysics Letters*, *Journal of Physics*, *European Physical Journal*, *Physica A*, *Macromolecules*, *PLOS ONE*.

PRESENTATIONS AT CONFERENCES AND INVITED TALKS

- 14/4/87 "Multifractality in Percolation", Meeting of Theoretical Physics and Condensed Matter, Fai della Paganella (Trento, Italy).
- 18/6/87 "Fractals and Multifractals in Physics", Summer School "Disorder and Mixing", Cargèse (France), 14-27 June 1987.
- 29/8/88 "Fractals and Multifractals: the applications in Physics", invited talk International Conference ETOPIM2 (Electrical Transport Optical Properties of Inhomogeneous Media), 29 August - 2 September 1988, Paris (France).
- 23/9/88 "Introduction to Cellular Automata", Workshop "Nonlinear dynamical models and advanced simulations for transport phenomena in magnetically confined plasmas", 21 - 23 September 1988, Cern, Orsay (France).
- 6/3/89 "Scaling Behaviour in Fracture Models", 9th General Conference of the Condensed Matter Division of the European Physical Society, 6-9 March 1989, Nice (France).
- 10/4/90 "Leggi di scala e modelli statistici per la frattura", Meeting of Statistical Mechanics and Field Theory, Bari (Italy), 9-11 April 1990.
- 6/7/90 "Damage spreading I: the Ising model and spin glasses", invited talk Summer School "Correlations and Connectivity: Geometric Aspects of Physics, Chemistry and Biology", Cargèse (France), 2-14 July 1990.
- 12/6/91 "Damage spreading in the Ising model and spin glasses", Miniworkshop on "Non-linearity: Fractals, Pattern Formation,...", Trieste, 11 June - 6 July 1991.
- 14/6/91 "Statistical models for the fracture of heterogeneous media", invited talk Adriatico Research Conference on "Physics of Inhomogeneous Materials", Trieste, 11-14 June 1991.
- 29-30/7/93 "Statistical models for fracture", invited talk Summer School "Recent Advances in Statistical Physics", Istanbul (Turkey), 25 July - 7 August 1993.
- 30/7/93 "Damage Spreading in the Ising model and spin glasses", invited talk Summer School "Recent Advances in Statistical Physics", Istanbul (Turkey), 25 July - 7 August 1993.
- 12/7/94 "Deep bed filtration: numerical results", invited talk Summer School "Mobile Particulate Systems", Cargèse (France), 4-15 July 1994.
- 15/11/95 "Statistical models for fracture", invited talk Workshop "Disordered Materials", Institute for Mathematics and its Applications, 13-17 Nov. 95, Minneapolis (USA).
- 6/7/98 "Statistical models for surface cracking", Conference ICCE-5, 5-11 July 98, Las Vegas (USA).
- 13/4/2000 "Complex viscoelastic behaviour at the sol-gel transition", International Workshop on "Scaling and Disordered Systems", 13-14 April 2000, ESPCI, Paris (France).

- 30/5/2001 "Complex dynamics in gelling systems", invited talk National Conference of Statistical Mechanics and Complex Systems, 29-31 May 2001, Parma (Italy).
- 25/10/2001 "Viscoelasticity in gelling systems", TMR Network Meeting "Fractal structures and Self-Organization", ESPCI, Paris (France).
- 8/12/2001 "Complex dynamics in gelling systems", invited talk International Conference "Horizons in Complex Systems", 5-8 December 2001, Messina (Italy).
- 28/2/2003 "Slow dynamics: from chemical to colloidal gels", invited talk International Conference "Percolating towards Ageing through Physics", 26-28 February 2003, Rio de Janeiro (Brazil).
- 30/5/2003 "Parallel Computing for Environmental Problems", invited talk International Workshop "Engineering the Grid", 30 May 2003, San Leucio (CE, Italy).
- 19/9/03 "Complex relaxation properties: from chemical to colloidal gels", invited talk Conference of the Italian Physics Society (SIF), 18-20 September 2003, Parma (Italy).
- 28/10/03 "Modelling Physics: from materials to environmental problems", keynote speaker European Simulation and Modelling Conference, 27-29 October 2003, Napoli (Italy).
- 28/7/04 "Slow dynamics and structural arrest in chemical and colloidal gels", invited talk Topical Workshop "Driven Many-Particle Systems – Hopping Particles, Granular Media, and Colloidal Systems", July 26-30 2004, Max Planck Institute for Complex Systems Physics, Dresden (De).
- 6/6/06 "Self-organized criticality model for brain plasticity", XX Sitges Conference on Statistical Mechanics on "Physical Biology: from Molecular Interactions to Cellular Behavior", June 5-9 2006, Sitges (Spain).
- 6/10/06 "Memory effects and universality in earthquake and solar flare occurrence", Workshop on "Complex Systems", Universitat de Barcelona, October 4-6 2006, Barcelona (Spain).
- 2/7/07 "Neuronal avalanches and brain plasticity", invited talk International Conference CTNEXT07: Complexity, Nonextensivity and Metastability, 2-5 July 2007, Catania (Italy).
- 10/7/07 "Statistical properties and universality in earthquake and solar flare occurrence", invited talk International Conference STATPHYS 23, 9-13 July 2007, Genova (Italy).
- 10/12/07 "A dynamical scaling approach to seismic occurrence", invited talk Workshop on Structure and Dynamics of Complex Networks, 10-14 December 2007, Brasilia (Brazil).
- 24/6/08 "Spatio-temporal correlations in seismicity: A dynamical scaling approach", invited talk XIII National Conference of Statistical Physics and Complex Systems, 23-25 June 2008, Parma (Italy).
- 26/11/08 "Activity dependent model for neuronal activity", invited talk Meeting "Complexity and Networks - Neuroscience", Institute for Mathematical Sciences, Imperial College, London (UK).
- 17/04/09 "Scaling and temporal organization of neuronal avalanches", Workshop "Interdisciplinary Topics in Statistical Physics", 17-18 April 2009, Venice (Italy).
- 22/06/09 "Scaling and temporal organization of neuronal avalanches", invited talk 17th International Workshop on "Nonlinear Dynamics of Electronic Systems", 21-24 June 2009, Rapperswil (CH).
- 20/07/09 "A dynamical scaling approach to earthquake occurrence", invited talk International School on Complexity "Grains, Friction and Faults", Ettore Majorana Foundation and Centre for Scientific Culture, Erice, 20-25 July 2009.
- 29/11/10 "Learning as a phenomenon occurring in a critical state", invited talk International Conference STATPHYS-KOLKATA VII, Saha Institute of Nuclear Physics, Kolkata 26-30 November 2010.
- 11/1/11 "Micromechanics of a seismic fault model", invited talk at the International Workshop "Applications of statistical mechanics to complex systems", Budapest, January 11-13, 2011.
- 22/2/11 "The challenge of seismic forecasting and the micro-mechanics of an earthquake" invited talk at the International Conference on Continuum Models and Discrete Systems CMDS 12, Kolkata, February 21-25, 2011.
- 1/3/11 "The search for correlations in earthquake occurrence", invited talk at the international meeting "Mechanics and Physics of Fracture", Indian Institute of Mathematical Sciences Chennai, February 28 - March 2, 2011.
- 1/5/12 "Activity dependent model for neuronal avalanches", invited talk at the International Symposium "Criticality in Neural Systems", NIH, Bethesda, MD (USA), April 30 - May 1, 2012.
- 10/5/12 "Comunicazione come trasferimento di informazione tra neuroni: un esperimento di linguaggio comune tra fisica e biologia", invited talk at the VI Meeting "Women in Science", Conference Center, Federico II University, Naples (Italy).
- 11/6/12 "Kinetics of bond formation and re-entrant phase diagram in cross-linked gelatin gels", 6th International Conference TOP (Times of Polymers & Composites, 10-14 June 2012, Ischia (Italy).
- 1/9/12 "Neuronal avalanches as a self-organized critical phenomenon", invited talk 3rd International Workshop on "Statistical Mechanics and Dynamical Systems", ITAP, Turunc (Turkey), 27 Aug.-2 Sept. 2012.

- 21/9/12 "Spontaneous neuronal activity as a self-organized critical phenomenon", plenary talk 12th Granada Seminar on Computational and Statistical Physics, La Herradura (Spain), 17-21 Sept. 2012.
- 26/6/13 "Collective properties of multi-task learning in neuronal networks", invited talk IOP Conference "Physics of Emergent Behaviour: From single cells to groups of individuals", Brighton (UK), 24-26 June 2013.
- 10/7/13 "Neuronal avalanches and learning: A statistical mechanics approach", invited lecture at the School on "Biological Complex Networks: From the cell to the brain and beyond", Natal (Brazil), 8-14 July 2013.
- 10/7/13 "Criticality in the Brain", plenary talk at StatPhys25, Seoul (K), 22-26 July 2013.
- 22/10/13 "Self-regulation of excitation and inhibition in the brain", invited talk at the Workshop "From dynamics to Statistical Physics and back", Max Planck Institute for the Physics of Complex Systems, October 21-23 2013, Dresden (D).
- 29/11/13 "Role of inhibitory synapses in multitask learning", invited talk at Elsevier Workshop "Chaos, Solitons & Fractals", Amsterdam, 29 November 2013.
- 10/1/14 "Self-regulating mechanisms of excitation and inhibition in the brain" invited talk at the Workshop "Dynamic systems: From Statistical Mechanics to Engineering Applications", ETH, 9-10 January 2014, Zurich (CH).
- 15/5/14 "Self-regulation of excitation and inhibition in the brain", invited talk at the International Workshop "Chaos and Dynamics in Biological Networks", 12-16 May 2014, Cargèse (France).
- 31/7/14 "Correlations in natural and biological phenomena", invited talk at the Workshop on "Criticality in Natural and Social Complex Systems", July 28- August 1 2014, Cuernavaca (Mexico).
- 11/9/14 "Role of Inhibitory Synapses in Multitask Learning" invited talk at the 3rd Workshop on "The Brain: Criticality, Dynamics, Network and Function", September 10-12, 2014, Malibu (USA).
- 12/1/14 "Avalanches in the Brain" Institute Lunch Talk, KAVLI Institute, "Avalanches, Intermittency, and Nonlinear Response in Far-From-Equilibrium Solids" Program, UCSB, Santa Barbara (USA).
- 12/11/14 "Temporal correlations in avalanching processes", invited talk KAVLI Institute, "Avalanches, Intermittency, and Nonlinear Response in Far-From-Equilibrium Solids" Program, UCSB, Santa Barbara (USA).
- 4/7/15 "Criticality and correlations in biological and natural phenomena", invited talk at the international workshop "Criticality in Biology: A Critical Assessment", 7-17 April 2015, Max Planck Institute for Physics of Complex Systems, Dresden (D).
- 6/1/15 "Criticality and correlations in neuronal networks", invited talk at the international NETSCI 15 Satellite "Brain Networks", 1-2 June 2015, Zaragoza (Spain).
- 1/9/15 "Correlations in the Brain", invited talk at the International Workshop "Complex Collective Dynamics: Brains and beyond", August 31 – September 4 2015, Anacapri (I).
- 9/9/15 "Correlations in the brain", invited talk at NDES 2015, September 7-11 2015, Como (I).
- 2/10/15 "Correlations in brain activity", invited talk at the Italian National Conference on Condensed Matter Physics *FisMat2015*, Sept.28- Oct.2 2015, Palermo (I).
- 14/10/15 "Correlations in natural and biological processes", invited talk at the International Conference "Challenges in Data Science: A complex systems perspective", October 14-17, 2015, Torino (I).
- 9/12/15 "Time-energy correlations as a hallmark of different branching processes", invited talk at the SM&FT 2015, *Computational approaches in Quantum Field Theory, Statistical Mechanics and Complex Systems*, Bari, December 9-11, 2015.
- 29/6/16 "Synaptic plasticity and neuronal refractory time at the origin of neuronal avalanche scaling behaviour", invited talk at the XXI Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi, Parma, June 27-29 2016.
- 1/9/16 "Time-energy correlations as a hallmark of different branching processes", invited talk to the workshop "Complex networks: from socio-economic systems to biology and brain", August 29 - September 2, 2016, Lipari (Italy).
- 13/9/16 "Time-energy correlations as a hallmark of different branching processes", invited talk to the 29th Marian Smoluchowski Symposium on Statistical Physics, September 12-16, 2016, Zakopane (Poland).
- 21/9/16 "Time-energy correlations as a hallmark of different branching processes", invited talk to the Workshop on "Burstiness in Human Behavior and Other Natural Phenomena", satellite CCS 2016, Sept. 21, 2016, Amsterdam.
- 26/9/16 "Correlations in brain activity", invited talk to the INFN Meeting 2016 Biophys & Pieces, 26-28 September 2016, Bari.

- 19/10/16 "Correlations in brain activity", invited talk to the workshop "Critical Brain Dynamics 2016", 17th - 19th October 2016, NIH, Bethesda (USA).
- 1/12/16 "On the nature of correlations in the brain", invited talk to the Conference Brain Modes 2016, Brussels December 1-2, 2016.
- 9/1/17 "Time-energy correlations as a hallmark of different branching processes", invited talk to the Conference Avalanche Processes in Condensed Matter Physics and Beyond, CRM Centre de Recerca Matemàtica, 9-13 January 2017, Barcelona.
- 26/3/17 "Temporal correlations in brain activity", invited talk to the Excellence workshop "Dynamical Network States, Criticality and Cortical Function", HWK Institute for Advanced Studies, Delmenhorst March 25-28 2017.
- 27/6/17 "Avalanches beyond power laws: temporal correlations in earthquakes, solar flares and brain activity", invited talk to the 9th Festival de Théorie "Avalanching and Self-Organization in Plasmas: 30 Years of BTW", June 26-July 7 2017, Aix-en-Provence, France
- 5/3/18 "Correlations in the brain", invited talk at the APS March Meeting, 5-9 March 2018, Los Angeles (USA).
- 19/6/18 "On the micromechanics of a granular seismic fault model", invited talk at the Workshop in honor of Dominique Jeulin "Physics and mechanics of random structures: from morphology to material properties", June 17-22 2018, Oléron, France.
- 22/6/18 "Temporal correlations in the brain", invited lecture at the School of Neuroengineering "Neurotechnologies and Computational Methods to Interact with the Brain", Genova June 18-22, 2018.

SEMINARS

- 5/12/86 "Multiscaling approach to Percolation", Colloquium of Theoretical Physics, Institute of Theoretical Physics, University Köln, Köln (FRG).
- 13/10/87 "Multifractal properties in Random Systems", Service de Physique Théorique, CEN, Saclay (France).
- 3/2/88 "Novel approach to Percolation", CBPF (Centro Brasileiro de Pesquisas Físicas), Rio de Janeiro (Brazil).
- 19/2/88 "Cellular Automata and spreading of Damage", Federal University of Alagoas, Maceio (Brazil).
- 22/2/88 "Multifractality in Percolation", Federal University of Pernambuco, Recife (Brazil).
- 15/6/89 "Damage spreading in spin systems", HLRZ, KFA, Jülich (Germany).
- 23/10/89 "Scaling Laws in Fracture", Department of Theoretical Physics, University of Umeå, Umeå (Sweden).
- 12/1/90 "Lois d'échelle dans la fracture", Laboratoire de Physique des Matériaux, CNRS, Meudon (France).
- 24/4/90 "Lois d'échelle dans la fracture", Laboratoire de Physique Statistique, Ecole Normale Supérieure, Paris (France).
- 9/5/90 "Modèles de fracture dans les matériaux hétérogènes", O.N.E.R.A., Chatillon (France).
- 9/4/91 "Méthode de la propagation du dommage dans le modèle d'Ising et les verres de spin", Laboratoire de Physico-Chimie Théorique, E.S.P.C.I., Paris (France).
- 12/4/91 "Modèles statistiques pour la fracture des milieux hétérogènes", L.P.M.M.H., E.S.P.C.I., Paris (France).
- 29/4/91 "Frattali e Multifrattali in Fisica", Department of Chemical Engineering, University of Napoli, Napoli (Italy).
- 18/6/91 "Dai frattali alla frattura", Colloquium at the Science Faculty, University of Potenza, Potenza (Italy).
- 8/3/93 "Modèles pour la fracture fragile des milieux hétérogènes", Institut Curie, Paris (France).
- 19/1/94 "Modelli statistici per la frattura di mezzi disordinati", Physics Department, University of L'Aquila, L'Aquila (Italy).
- 21/11/94 "Fissurazione e frattura nei mezzi eterogenei", Physics Department, University of Salerno, Salerno (Italy)..

- 10/4/95 "Modelli statistici per la rottura dei materiali", Department of Chemical Engineering, University of Napoli, Napoli (Italy).
- 11/5/2000 "Leggi di scala in frattura", Physics Department, University of Napoli Federico II, Napoli (Italy).
- 14/9/2000 "Dynamical behaviour at the gelation transition", Laboratoire PMMH, ESPCI, Paris (France).
- 5/11/2001 "Complex dynamics in gelling systems", Institute ICA1, University of Stuttgart, Stuttgart (Germany).
- 3/7/2003 "A unifying approach to relaxation properties of chemical and colloidal gels", Physics Department, University of Bari (Italy)..
- 10/2/2006 "Earth crust memory, earthquake remote triggering and Self Organised Criticality", Physical Science Department, University of Napoli "Federico II".
- 10/11/06 "Memory effects and universality in earthquake and solar flare occurrence", Computational Physics Laboratory, Institute for Building Materials, ETH, Zurich (CH).
- 4/10/07 "Neuronal avalanches and brain plasticity", Physics Department, Koc University, Istanbul, Turkey.
- 5/10/07 "Correlations and universality in earthquake occurrence", Physics Department, Istanbul Technical University, Istanbul, Turkey.
- 28/03/08 "Correlations in seismic occurrence", Physics Department, University of Catania (Italy).
- 10/12/08 "Neuronal avalanches and brain plasticity", Computational Physics Laboratory, Institute for Building Materials, ETH, Zurich (CH).
- 10/3/09 "Spam flooding of your mailbox", Interdisciplinary Seminar for the Program "Modeling Complex Socio-Economic Systems and Crises", Center of Competence "Coping with Crises in Socio-Economic Systems", ETH, Zurich (CH).
- 31/3/09 "Neuronal avalanches and brain plasticity", Physics Department, Akdeniz University, Antalya (Turkey).
- 26/8/09 "Waiting Times in Earthquakes and Neuronal Avalanches", Section on Critical Brain Dynamics, Laboratory of Systems Neuroscience, National Institute of Health, Bethesda (USA).
- 16/12/09 "Neuronal Avalanches and Learning", Department of Neuroscience and Brain Technologies, IIT Italian Institute of Technology, Genova (Italy).
- 6/1/10 "Neuronal Avalanches and Learning", Service de Physique de l'Etat Condensé, CEA, Saclay (F).
- 10/6/10 "Neuronal Avalanches and Learning", Department of Organic Chemistry and Biochemistry, University of Naples Federico II.
- 17/11/10 "Learning as a phenomenon occurring in a critical state", Physics Department, University of Naples Federico II.
- 27/4/11 "Correlazioni e mappe di probabilità per l'accadimento sismico", Department of Information Engineering, SUN.
- 20/9/11 "Learning by neuronal avalanches", Laboratory of Statistical Biophysics, EPFL, Lausanne (CH).
- 19/10/12 "Balance between excitation and inhibition controls the temporal organization of neuronal avalanches", Laboratory PMMH, ESPCI, Paris (F).
- 23/10/12 "Homeostatic mechanisms in the temporal organization of neuronal avalanches", Complexity seminar, Complexity & Networks Group, Imperial College, London (UK).
- 18/10/16 "Criticality and correlations in the brain", Physics Colloquium at the Physics Department, Georgetown University, Washington DC (USA).

ORGANIZATION OF CONFERENCES

- 9/26 - 10/7 1988 Workshop "Computer simulations of Cellular Automata" at CECAM (Centre Européen de Calcul Atomique et Moléculaire) Orsay (France), in collaboration with H.J. Herrmann and M. Kolb. The collection of Abstracts of the presented papers is published on the Journal of Statistical Physics, 55, 1333 (1989).
- 3/19 1991 Meeting "La fracture dans les milieux hétérogènes", for the Institut d'Expertise et de Prospective de l'Ecole Normale Supérieure, Paris (France).
- 7-9/6 2001 Workshop PRIN 2000 e PRA (HOP), Villa Orlandi, Anacapri (Italy).
- 23-24/5 2002 Workshop "Relaxation in Complex Systems", Villa Orlandi, Anacapri (Italy).
- 6-7/6 2002 European TMR Meeting "Fractals and Self Organization", Villa Orlandi, Anacapri (Italy).
- 15/4 2003 Scientific Day of Sezione Tematica Modellistica part of Centro Regionale di Competenza "Analisi e Monitoraggio del Rischio Ambientale", University of Naples Federico II, Naples (Italy).

- 4-6/7 2007 Satellite Conference of StatPhys23 "Statics and dynamics of granular media and colloidal suspensions", Napoli (Italy).
- 27/4-2/5 2008 Workshop "Modelling geophysical systems by statistical mechanics methods", at the Ettore Majorana Foundation and Centre for Scientific Culture, Erice (Italy).
- 2-5/6 2012 International Conference "Frontiers in statistical physics and complex systems" Nettuno Hotel, Catania (Italy).
- 2-6/9 2013 International Workshop "The Brain: Criticality, Dynamics, Networks and Function", Villa Orlandi, Anacapri.
- 10-12/9 2014 International Workshop "The Brain: Criticality, Dynamics, Networks and Function", HLR Laboratories, Malibu (USA).
- 31/8-4/9 2015 International Workshop "Complex Collective Dynamics: Brains and Beyond", Villa Orlandi, Anacapri.
- Member of the steering committee of the Conference StatPhys 27, Buenos Aires 2019.

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