

Curriculum vitae et studiorum

Prof. Emilio N.M. Cirillo
Roma, 16 September 2019

General informations

- Family name: Cirillo
- Name: Emilio Nicola Maria
- Address: Dipartimento SBAI, via A. Scarpa 16, 00161 Roma, Italy
- Phone number: +390649766808
- E_mail address: emilio.cirillo@uniroma1.it
- ORCID: 0000-0003-3673-2054
- Working status: full professor of Mathematical Physics at Dipartimento di Scienze di Base e Applicate per l'Ingegneria, Sapienza Università di Roma
- Spoken languages: italian, english, and french
- Interests: Statistical Mechanics, interacting particle systems, equilibrium and out of equilibrium systems, rigorous results and Monte Carlo simulations, porous media
- Computer experience: programming languages C and Fortran, Linux, Unix, \LaTeX .

Education

- PhD: “dottorato di ricerca in Fisica” (PhD in Physics) at Università degli Studi di Bari in 1997. Advisors: Prof. Enzo Olivieri (II Università di Roma Tor Vergata) and Dr. Giuseppe Gonnella (Università degli Studi di Bari). Title of PhD thesis: Aspetti statici e dinamici delle transizioni di fase: alcuni modelli e metodologie (Statical and dynamical aspects of phase transitions: models and methods).
- University: graduated summa cum laude in Physics at Università degli Studi di Bari in 1993. Title of “Laurea” thesis: Metastabilità e nucleazione: studio rigoroso di alcune dinamiche microscopiche (Metastability and nucleation: a rigorous study of some microscopic dynamics). Laurea thesis advisors: Professor Enzo Olivieri (Università di Roma Tor Vergata) and Professor Matteo Villani (Università degli Studi di Bari).
- High school: attended “Liceo Scientifico” (scientific high school) and passed the final examination with the maximum.

Habilitations

- 2013, Full Professor national scientific habilitation in Mathematical Physics (01/A4).
- 2013, Associate Professor national scientific habilitation in Mathematical Physics (01/A4).

Positions

- September 2019 – : full professor of Mathematical Physics, Sapienza Università di Roma.
- October 2015 – September 2019: associate professor in Mathematical Physics, Sapienza Università di Roma.

- November 2000: “ricercatore universitario” (assistant professor) in Mathematical Physics, Università degli Studi di Roma “La Sapienza.”
- July 1999: two year researcher position at “II Università degli Studi di Roma – Tor Vergata”.
- October 1998: one year postdoc position at the Mathematics Department of the “Université Paul Sabatier de Toulouse.” Research activity carried out at “CMI – Université de Provence – Marseille.”
- October 1997: one year postdoc position at the Mathematics Department of the “Université Paris Sud.”

Research associations

- Gruppo Nazionale di Fisica Matematica (GNFM).
- Centro di Ricerca CERSITES.

Visits abroad

- June 2019, Département de Mathématiques et Applications, Ecole Normale Supérieure, Paris, France.
- June–July 2017, Department of Mathematics, Utrecht University, The Netherlands.
- June 2014, Institute for Complex Molecular Systems (ICMS), TU/Eindhoven, The Netherlands.
- May 2014, Institute for Complex Molecular Systems (ICMS), TU/Eindhoven, The Netherlands.
- March 2013, Department of Mathematics, Utrecht e Department of Mathematics, Delft, The Netherlands.
- February 2012, “Stochastic Activity Month” a Eurandom, Eindhoven, The Netherlands.
- February–March 2001, Physics Department, Theoretical Physics Division, Helsinki, Finland.
- Fall 1996, Mathematics Department, Rutgers University, New Brunswick, NJ, US.

Academic activity

- Member of the PhD Committee Meccanica Teorica e Applicata, Sapienza Università di Roma, since 2009.
- Since September 2011, responsible of the computation server of the Mathematics Division of the Dipartimento di Scienze di Base e Applicate per l'Ingegneria, Sapienza Università di Roma.
- Member of the Academic Senate of Sapienza Università di Roma, elected as representative of the associate professors of the scientific area, from November 2016 to September 2019.
- March 2012 – November 2013: member of the Sapienza Università di Roma Scientific Committee.
- Member of the Scientific Committee of the Mathematics Division of the Dipartimento di Scienze Applicate e di Base per l'Ingegneria from June 2011 to June 2012.
- Member of the Scientific Committee of the Mathematics Division of the Dipartimento di Metodi e Modelli Matematici per le Scienze Applicate from January 2010 to July 2010.
- 2003–2009 Coordinator of the “Dipartimento MeMoMat” committee supervising the information systems and the local area network of the department itself.

Member of PhD defense committee

- June 2019: member of the “Jury de soutenance” for the “Thèse de Doctorat in Mathématique” of Wei Zhou, Université paris–Saclay.
- December 2018: member of the Committee for the PhD defense of Riccardo Mariani, Université Aix–Marseille and Università Tor Vergata.
- May 2018: member of the Committee for the PhD defense of Ji Myeong Lee, GSSI (Gran Sasso Science Institute).
- October 2012: opponent in the Committee for the PhD thesis “Metastability for low–temperature Kawasaki dynamics with two types of particles,” Alessio Troiani, Faculteit der Wiskunde en Natuurwetenschappen, Leiden University.
- August 2012: member of the Reading Committee for the PhD thesis “Metastability for low–temperature Kawasaki dynamics with two types of particles,” Alessio Troiani, Faculteit der Wiskunde en Natuurwetenschappen, Leiden University.

PhD students

- 2014–17: supervisor of the PhD thesis “Particle based modelling of dynamics in presence of obstacles,” dott. Alessandro Ciallella.
- 2012–15: supervisor of the PhD thesis “On phase transitions in porous media under consolidation: analytic, rigorous and numerical results,” dott. Pietro Artale Harris.
- 2007: supervisor of the PhD thesis “Rigorous results on models of non equilibrium statistical mechanics,” dr. Cristian Spitoni, PhD school “Modelli e Metodi Matematici per la tecnologia e la società.”

Teaching

- 2019–20: “Modelli Matematici per la Meccanica,” co–teacher D. Andreucci, Laurea in Ingegneria Aerospaziale, Sapienza Università di Roma.
- From 2018–19 to 2019–20: “Fisica Matematica,” Laurea in Ingegneria Civile, Sapienza Università di Roma.
- From 2008–09 to 2019–20: “Meccanica Razionale,” Laurea in Ingegneria Civile e Industriale, Sapienza Università di Roma, Latina.
- 2017–18: “Fisica Matematica,” co–teacher D. Andreucci, Laurea Magistrale in Ingegneria Meccanica, Sapienza Università di Roma.
- From 2013–14 to 2017–18: “Laboratorio di Meccanica Razionale,” Laurea in Ingegneria Civile e Industriale, Sapienza Università di Roma, Latina.
- 2017–18: “Statistical Mechanics,” Dottorato di Ricerca in Meccanica Teorica e Applicata, Sapienza Università di Roma.
- 2016–17: “Statistical Mechanics,” Dottorato di Ricerca in Meccanica Teorica e Applicata, Sapienza Università di Roma.

- 2014–15: “Statistical Mechanics,” Dottorato di Ricerca in Meccanica Teorica e Applicata, Sapienza Università di Roma.
- 2013–14: “Laboratorio di Meccanica Analitica,” Laurea Magistrale in Ingegneria Meccanica, Sapienza Università di Roma.
- 2010–11: “Statistical Mechanics,” Dottorato di Ricerca in Meccanica Teorica e Applicata, Sapienza Università di Roma.
- From 2004–05 to 2007–08: “Fisica Matematica,” Laurea Specialistica in Ingegneria Meccanica, Università di Roma “La Sapienza.”
- 2007–08: “Statistical Mechanics,” Dottorato di Ricerca in Meccanica Teorica e Applicata, Università di Roma “La Sapienza.”
- 2003–04: “Meccanica Razionale,” Corso di Laurea in Ingegneria Meccanica, Università di Roma “La Sapienza.”
- 2002–03: lectures for “Metodi matematici per l’Ingegneria,” Corso di Laurea in Ingegneria Civile, Università di Roma “La Sapienza.”
- 2001–02: “Meccanica Razionale,” Corso di Laurea in Ingegneria Meccanica e Aerospaziale, Università di Roma “La Sapienza,” Latina.
- 2001–02: “Metodi Matematici,” Corso di Laurea in Ingegneria Meccanica, Università di Roma “La Sapienza.”
- AA 2000–01: exercises for “Meccanica Razionale,” Corso di Laurea in Ingegneria Meccanica, Università di Roma “La Sapienza.”
- 2000–01: exercises for “Metodi Matematici per l’Ingegneria,” Corso di Laurea in Ingegneria Meccanica, Facoltà d’Ingegneria, Università di Roma “La Sapienza.”
- 2000–01 exercises for “Sistemi Dinamici” (Prof. G. Gentile), III Università di Roma.
- 1999–00: exercises for “Probabilità e Statistica” (Prof. F. Martinelli), III Università di Roma.
- 1999–00: exercises for “Sistemi Dinamici” (Prof. G. Gentile), III Università di Roma.
- 1996–97: exercises for “Fisica II” for Ingegneria Elettronica (Prof. G. Selvaggi), Politecnico di Bari.
- 1995–96: exercises for “Fisica II” for Ingegneria Elettronica (Prof. L. Guerriero), Politecnico di Bari.
- 1994–95: exercises for “Fisica II” for Ingegneria Elettronica (Prof. L. Guerriero), Politecnico di Bari.

Research projects

- 2018. Progetto Ricerca Sapienza “Heterogeneous environments in biological systems, pedestrian motion and materials with memory” (RM118164367D6ACA).
- 2017. Progetto Ricerca Sapienza “Evolution phenomena in heterogeneous environments: application to biological systems, pedestrian motion and materials with memory”.

- 2014. Ricerche Universitarie Sapienza Università di Roma. “Modelli matematici per il moto di individui interagenti”.
- 2012. Visiting project Sapienza Università di Roma, A. Muntean (TU/e, Eindhoven, The Netherlands), “Modelli matematici per l’evacuazione di una regione chiusa in assenza di visibilità.”
- 2009. Ateneo Federato di Scienza e della Tecnologia dell’Università degli Studi di Roma “La Sapienza”, “Aspetti dinamici delle transizioni di fasi in sistemi continui e di spin.”
- 2008. Ateneo Federato di Scienza e della Tecnologia dell’Università degli Studi di Roma “La Sapienza”, “Aspetti dinamici delle transizioni di fasi in sistemi continui e di spin.”
- 2007. Ateneo Federato di Scienza e della Tecnologia dell’Università degli Studi di Roma “La Sapienza”, “Dinamiche stocastiche per sistemi di particelle e di spin.”
- 2006. Facoltà d’Ingegneria dell’Università degli Studi di Roma “La Sapienza”, “Dinamiche stocastiche per sistemi di particelle e di spin.”
- 2005. Facoltà d’Ingegneria dell’Università degli Studi di Roma “La Sapienza”, “Dinamiche stocastiche per sistemi di particelle e di spin.”
- 2004. Facoltà d’Ingegneria dell’Università degli Studi di Roma “La Sapienza”, “Sistemi a finiti e infiniti gradi di libertà.”
- 2003. Facoltà d’Ingegneria dell’Università degli Studi di Roma “La Sapienza”, “Sistemi a finiti e infiniti gradi di libertà.”
- 2001. MURST, Progetto giovani ricercatori. “Gruppo di Rinormalizzazione e Metastabilità nei Modelli di Spin.”
- 2001. Gruppo nazionale per la Fisica Matematica (GNFM), “Aspetti statici e dinamici della transizioni di fase.”
- 2011. Ricerca Universitario di Sapienza Università di Roma, “Sistemi dinamici classici e quantistici.” Coordinator: Prof. Carlo Marchioro.
- 2010. Ricerca Universitario di Sapienza Università di Roma, “Evoluzione deterministica e stocastica di sistemi a molte componenti in fisica matematica ed applicazioni.” Coordinator: Prof. C. Boldrighini.
- 2009. PRIN “Analisi asintotiche di sistemi classici e quantistici nelle Teorie Cinetiche” (24 months). Coordinator: prof. Mario Pulvirenti.
- 2009. Ateneo Federato di Scienza e della Tecnologia dell’Università degli Studi di Roma “La Sapienza”, “Modelli continui per materiali eterogenei: applicazioni allo studio di mezzi porosi e fratturati.” Coordinator: dott. Giulio Sciarra.
- 2009. Ricerca Universitario Sapienza Università di Roma “Comportamento macroscopico di sistemi a molte componenti.” Coordinator: Prof. C. Boldrighini.
- 2008. CNR, “Modelli poromeccanici dei processi di liquefazione dei suoli.” Coordinator: dott. Giulio Sciarra.
- 2008. Ricerca Universitario Sapienza Università di Roma, “Sistemi a molte componenti con evoluzione deterministica e stocastica.” Coordinator: Prof. C. Boldrighini.
- 2008. Grandi attrezzature Sapienza Università di Roma, “Infrastrutture di rete e macchine per il calcolo scientifico.” Coordinator: Prof. Romano Scozzafava.
- 2007. Ricerca Universitario Sapienza Università di Roma, “Sistemi a molte componenti con evoluzione deterministica e stocastica.” Coordinator: Prof. C. Boldrighini.
- 2006. Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Sistemi a molte componenti con evoluzione deterministica e stocastica (continuazione).” Coordinator: Prof. C. Boldrighini.
- 2006. PRIN, “Comportamento cinetico ed idrodinamico di sistemi complessi classici e quantistici” (24 months). Coordinator: Prof. Carlo Cercignani.
- 2005. Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Sistemi a molte componenti con evoluzione deterministica e stocastica.” Coordinator: Prof. C. Boldrighini.
- 2005. Grandi attrezzature dell’Università degli Studi di Roma “La Sapienza”, “Cluster per il calcolo e dispositivi di rete.” Coordinator: Prof. Alessandro Bichara.
- 2004–05. PRIN, “Sistemi a numero infinito di gradi di libertà classici, quantistici, stocastici” (24 months). Coordinator: Prof. Giovanni Jona Lasinio.
- 2004. Progetto d’Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Metodi matematici per lo studio di proprietà macroscopiche.” Coordinator: Prof. V. Nesi.
- 2003. Progetto d’Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Equazioni alle derivate parziali classiche e stocastiche in teoria dei materiali compositi,

Participant to research projects

- 2016. Progetto Ricerca Sapienza “Asymptotical methods in linear and nonlinear evolution problems.” Coordinator: prof. S. Carillo.
- 2015. Grandi Ricerche Universitarie Sapienza. “Asymptotics of inhomogeneous diffusion problems.” Coordinator: prof. D. Andreucci.
- 2012. PRIN ““Problemi matematici in teoria cinetica e applicazioni” (36 months). Coordinator: prof. Mario Pulvirenti.
- 2011. Stochastic Theoretical and Applied Research proposal 2011, Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) project. “Metastable and cut-off behavior of stochastic processes.” Principal investigator: F.R. Nardi.
- 2011. Ateneo di Sapienza Università di Roma denominato “Low Dose Positron Emission Tomography;” coordinator: Prof. Riccardo Faccini.

- biomatematica, meccanica classica dei continui e meccanica quantistica.” Coordinator: Prof. V. Nesi.
- 2002. PRIN, “Sistemi dinamici classici, quantistici e stocastici” (24 months). Coordinator: Prof. Giovanni Jona Lasinio.
 - 2002. Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Metodi asintotici in equazioni alle derivate parziali” (C26A018988). Coordinator: Prof. V. Nesi.
 - 2001. Ateneo dell’Università degli Studi di Roma “La Sapienza”, “Metodi asintotici in equazioni alle derivate parziali in dimensione finita o infinita” (C26A018988). Coordinator: Prof. Gianfausto dell’Antonio.
 - 2001. Progetto della Facoltà d’Ingegneria dell’Università degli Studi di Roma “La Sapienza”, “Operatori di aggregazione, integrali monotoni, misure fuzzy” (C26F015751). Coordinator: Prof. Pietro Benvenuti.
 - 2000–01. MIUR, “Sistemi dinamici classici, quantistici e stocastici.” Coordinator: Prof. Giovanni Jona Lasinio.
 - 1998–99. MURST, “Studio di sistemi dinamici classici, quantistici e stocastici con i metodi della fisica teorica, della fisica matematica e della simulazione numerica.” Coordinator: Prof. Giovanni Jona Lasinio.
- Some talks
- Equilibrium and Non-equilibrium Statistical Mechanics, a conference in honor of F. Dunlop, April 8–10 2019, Villa Finaly, Firenze, Italy. “Microscopic stochastic particle models for Fick and Fokker–Planck diffusion equations.”
 - Karlstad Applied Analysis Seminar (KAAS), Karlstads Universitet, Karlstad, Sweden, 13th March, 2019, “Microscopic models for Fick and Fokker–Planck diffusion equations.”
 - Karlstad Applied Analysis Seminar (KAAS), Karlstads Universitet, Karlstad, Sweden, 21st March, 2018, “Lattice models for particle flow through obstacles.”
 - Seminar Series in Probability and Statistics, Applied Mathematics Department, TU Delft, The Netherlands, 4th July, 2017, “Particle-based modelling of flows through obstacles.”
 - ICMS Complexity Science Winter School, TU Eindhoven, February 13–17 2017, The Netherlands. “Obstacle induced particle jamming in exclusion dynamics.”
 - Mathematics of kinetically constrained dynamics and metastability, 4–8 January 2016, Warwick, UK. “Exit time in presence of multiple metastable states.”
 - Institute for Complex Molecular Systems, Eindhoven, The Netherlands, June 17th, 2014, “Effects of cooperation on pedestrian motion in dark.”
 - Eurandom, Eindhoven, The Netherlands, June 10th, 2013, “Metastable behavior of reversible Probabilistic Cellular Automata.”
 - Department of Mathematics, Delft, The Netherlands, March 20th, 2013, “Multiple metastable states in Blume–Capel model.”
 - Analysis, modeling, and simulation of collective dynamics: from bacteria to crowds, July 9–13, 2012, CISM, Udine, Italy. “A lattice model for the dynamics of pedestrians in regions with no visibility.”
 - The expanding art of expansions, February 14–17, 2012, Eurandom, Eindhoven, The Netherlands. “Graded Cluster Expansion.”
 - Mathematics and ICMS seminar on particle systems, Department of Mathematics and Computer Science, February 10th, 2012, TUE, Eindhoven, The Netherlands. “Monte Carlo study of gating and selection in potassium channels.”
 - Marc Kac Seminar, February 3rd, 2012, Utrecht, The Netherlands. “Metastable states in Probabilistic Cellular Automata.”
 - Sviluppi recenti in fisica matematica, 11–12 febbraio 2009, L’Aquila. “Stati metastabili in competizione in un automa cellulare probabilistico.”
 - SIMAI 9th Congress, 15th September, 2008, Roma, Italy. “Competitive nucleation in metastable systems.”
 - Eurandom, January 10th, 2008, Eindhoven, The Netherlands, “Metastable behavior of reversible Probabilistic Cellular Automata with self-interaction.”
 - Eurandom, June 12th, 2007, Eindhoven, The Netherlands, “Decay of correlations in disordered systems.”
 - Meeting Phasenübergänge, June 20th – 26th, 2004, Oberwolfach (Germany). “Graded cluster expansion for renormalized systems.”
 - Assemblea scientifica G.N.F.M., 17–19 Febbraio 2003, Montecatini. “Gruppo di rinormalizzazione e sistemi disordinati.”
 - Dynamical Systems: Classical, Quantum and Stochastic, September 14–19, 2002, Serra degli Alimini, Otranto, Italy. “Disordered systems and weak gibbsianess of renormalized measures.”
 - Ciclo di seminari di Fisica Matematica, Dipartimento di Matematica, Università degli studi di Roma “Tor Vergata”, 18 Febbraio 2002, “Misure di Gibbs e Gruppo di Rinormalizzazione.”
 - Ciclo di seminari INFN, Dipartimento di Fisica, Università degli studi di Bari, 29 Gennaio 2002, “Misure di Gibbs e Gruppo di Rinormalizzazione.”
 - Seminars of the Theoretical Physics Division, University of Helsinki, 22th March, 2001. “Metastability in spin systems and Probabilistic Cellular Automata.”
 - Dipartimento di Matematica, Università L’Aquila, L’Aquila, Gennaio, 2000, “Percolazione ricorsiva in tre dimensioni.”
 - Mathematics Department, Imperial College, London, May 22nd, 1999, “Finite size scaling in three dimensional bootstrap percolation.”
 - Séminaires de Probabilité, Marseille, 2 Avril 1999, “Three dimensional bootstrap percolation: the finite size scaling.”
 - Ciclo di seminari INFN, Bari, Dicembre 1998, “Effetti di scala finita in un modello di bootstrap percolation.”

- Macroscopic stochastic fluctuations: Equilibrium and non-equilibrium, September 9 – 15, 1998, Vulcano, Italy. “Finite size scaling in three dimensional bootstrap percolation.”
- Séminaires de Probabilité, Marseille, 22 Mai 1998, “Metastable states in finite volume spin systems.”
- Ciclo di seminari INFN, Bari, 12 Maggio 1998, “Metastabilità nei modelli di spin e negli Automi Cellulari Probabilistici.”
- Séminaires de Probabilité et Statistique, Orsay (Paris), 5 Mars 1998, “Competing metastable states.”
- Inhomogeneous random systems, non-gibbsian states, Wulff shapes, 28 – 29 January 1997, Ecole Polytechnique, Palaiseau, Paris, “Metastability in the Ising Model with free boundary conditions.”
- Workshop I.N.d.A.M. “Mathematical problems in the statistical mechanics of interfaces”, 9 – 15 June 1996, Cortona (Ar), Italy, “Competing metastable states.”
- Ciclo di seminari INFN, Bari, 5 Giugno 1996, “Stati metastabili in competizione.”
- Convegno informale di Meccanica Statistica, 23 – 24 Giugno 1995, Parma, “Meccanismi di nucleazione della fase stabile nel modello di Blume–Capel.”

Editing activity

- Associate editor of the book “Probabilistic Cellular Automata – Theory, Applications and Future Perspectives,” main eds. P.-Y. Louis and F.R. Nardi, associate eds. Emilio N.M. Cirillo. N. Fatés, R. Fernández, R.M.H. Merks, W.R. Ruszel, C. Spitoni, DOI 10.1007/978-3-319-65558-1, Springer International Publishing, 2018.
- Editor of the book “Complementi alle Lezioni di Meccanica Razionale” di T. Levi-Civita e U. Amaldi, eds. E.N.M. Cirillo, G. Maschio, G. Saccomandi e T. Ruggeri, Edizioni Compomat, Configni, Italia, 2012, ISBN 978-88-95706-31-3 e ISBN 978-88-95706-33-7.
- Reviewer and referee for several scientific journals.
- Translation from English to Italian: Neil A. Weiss, “Calcolo delle probabilità” (Pearson Education Italia, 2008).
- Editing: John R. Taylor, “Meccanica classica” (Zanichelli, Bologna, 2006).
- Editing: Herbert Goldstein, Charles Poole, John Safko, “Meccanica classica,” terza edizione (Zanichelli, Bologna, 2005).
- Translation from English to Italian: Douglas C. Giancoli, “Fisica” (CEA, Milano, 2006).
- Translation from English to Italian: D. Halliday, R. Resnick, K.S. Krane, “Fisica,” volume I (CEA, Milano, 2002).
- Translation from English to Italian: Behrouz A. Forouzan, “I protocolli TCP/IP” (Mc Graw – Hill, Milano, 2001).

Research activity and list of publications

Prof. Cirillo’s research activity mainly deals with Statistical Mechanics, Interacting Particle Systems, Porous media, and Cellular Automata.

Topic: Carbon nanotube WIMP detectors

Keywords: WIMP, billiards, Random Walk, carbon nanotubes

Collaborators: G. Cavoto (Sapienza), F. Cocina (Sapienza), J. Ferretti (Sapienza), A.D. Polosa (Sapienza)

Publications: [16]

Topic: Diffusion equation for heterogeneous systems

Keywords: heat equation, diffusion, Fick’s law, Fokker–Planck’s equation, Random Walk, hydrodynamic limit

Collaborators: D. Andreucci (Sapienza), M. Colangeli (L’Aquila), D. Gabrielli (L’Aquila), M. Amar (Sapienza)

Publications: [6, 10]

Topic: Transport and condensation in Zero Range Process

Keywords: Random Walk, Zero Range Process, condensation, stationary state, blockage, current, threshold model

Collaborators: A. Muntean (Karlstad), M. Colangeli (L’Aquila), L. Rondoni (Torino), R. Dickman (Belo Horizonte)

Publications: [1, 2, 4, 10, 11, 15, 17, 18, 23, 72]

Topic: Cooperative effects on particle currents

Keywords: Random Walk, Simple Exclusion, motion in dark, crossing time. measure theory, diffusive and ballistic scalings

Collaborators: R. van Santen (ICMS Eindhoven), A. Muntean (Karlstad), O. Krehel (ICMS Eindhoven), A. Sengar (ICMS Eindhoven), M. Böhm (Bremen), A. Ciallolla (Sapienza), P.L. Curşeu (Heerlen), J. Sohler (Paris XII), I. De Bonis (Benevento), O. Richardson (Karlstad)

Publications: [7–9, 14, 25, 30, 33, 72, 75, 85]

Topic: Voltage–current curves in ionic channels

Keywords: ionic channel, potassium channel, random walk, diffusion

Collaborators: D. Andreucci (Sapienza), S. Marconi (Sapienza), D. Bellaveglia (Sapienza)

Publications: [27, 28, 37, 76, 78]

Topic: Growth models diffusion limited aggregation (DLA)

Keywords: percolation, bootstrap percolation,

Collaborators: R. Cerf (ENS, Paris), A. Asselah (Paris XII), E. Scoppola (Roma 3), B. Scoppola (Roma 2)

Publications: [21, 55]

Topic: General theory of metastability

Keywords: metastable states, Metropolis, reversible systems, Freidlin–Wentzel theory, cycle theory

Collaborators: F.R. Nardi (TU/e, Eindhoven), J. Sohler (Paris XII)

Publications: [19, 26, 31]

Topic: Metastability in spin models

Keywords: lattice spin systems, metastability, large deviations, tunneling

Collaborators: E. Olivieri (Roma 2), J.L. Lebowitz (Rutgers), F.R. Nardi (TU/e, Eindhoven), C. Spitoni (Utrecht)

Publications: [31, 52, 60, 69, 79]

Topic: Metastability in Probabilistic Cellular Automata (PCA)

Keywords: PCA (Probabilistic Cellular Automata), metastability, large deviations, tunneling

Collaborators: J.L. Lebowitz (Rutgers), E. Speer (Rutgers), F.R. Nardi (TU/e, Eindhoven), C. Spitoni (Utrecht)

Publications: [12, 40, 41, 50, 57, 73, 74, 82]

Topic: Equilibrium properties of Probabilistic Cellular Automata

Keywords: PCA (Probabilistic Cellular Automata), equilibrium, Mean Field, Cluster Variation Method

Collaborators: F.R. Nardi (TU/e, Eindhoven), A.D. Polosa (Sapienza), P.-Y. Louis (Poitiers), W. Ruszel (Delft), C. Spitoni (Utrecht)

Publications: [29, 53]

Topic: Second gradient theory for porous media and gels

Keywords: second gradient, continuum mechanics, porous media, Biot theory, phase transitions, interfaces, variational methods, dynamical systems

Collaborators: N. Ianiro (Sapienza), G. Sciarra (Sapienza), P. Artale Harris (Sapienza), P. Nardinocchi (Sapienza), A. Muntean (Karlstad)

Publications: [13, 20, 22, 24, 32, 34, 38, 39, 80]

Topic: Entropic effects in doped polymer swelling

Keywords: polymers, teflon, gold nanoparticles doping, Flory–Huggins theory, swelling, acetone detector

Collaborators: A. Convertino (CNR), A. Capobianchi (CNR), A. Valentini (Bari), A. Bassi (Bari), N. Cioffi (Bari), L. Torsi (Bari)

Publications: [48, 49, 51]

Topic: Disordered systems in Griffiths’ phase

Keywords: disordered systems, Griffiths’ phase, Cluster Expansion

Collaborators: E. Olivieri (Roma 2), L. Bertini (Sapienza), R. Greenblatt (Sapienza)

Publications: [42, 43, 45, 47, 81]

Topic: Renormalization group

Keywords: Renormalization group, fixed point, convergence, pathologies, gibbsianity

Collaborators: E. Olivieri (Roma 2), L. Bertini (Sapienza)

Publications: [43, 45–47, 56, 63]

Topic: Defect free surface models

Keywords: lattice models for surfaces, spin models, Cluster Variation Method, Mean Field, superantiferromagnetic and lamellar phases, Renormalization group, Kadanof transformation

Collaborators: G. Gonnella (Bari), M. Troccoli (Bari), D. Johnston (Edinburgh), A. Maritan (Padova), A. Pelizzola (Torino)

Publications: [59, 62, 65, 66, 71]

Topic: Growth and persistence exponents in spinodal decomposition

Keywords: continuous phase transition, spinodal decomposition, growth exponent, persistence exponent, Monte Carlo, shear

Collaboratori: G. Gonnella (Bari), S. Stramaglia (Bari), G.P. Saracco (La Plata)

Publications: [44, 58, 61, 64, 70]

Topic: Crumpling transition in polymerized surfaces Cluster Variation Method

Keywords: folding, crumpling, polymerized surfaces,

Collaborators: G. Gonnella (Bari), A. Pelizzola (Torino)

Publications: [35, 54, 67, 68]

Topic: Exotic tetraquark

Keywords: tetraquark, random matrices, Wigner distribution

Collaborators: M. Mori (Sapienza), A.D. Polosa (Sapienza)

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