

Andrea Puglisi - Short CV (updated to October 26, 2021)

Born in Rome on the 11th of June, 1973

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Fields of activity

I have studied for many years the statistical mechanics of fluidized granular materials (kinetics, hydrodynamics, structure, non-equilibrium properties). Building upon my experience with granular models, I have investigated some problems in the more general field of non-equilibrium statistical mechanics for steady states (fluctuation-response relations, large deviation theory for stochastic processes, fluctuations of currents and entropy production). In all my works I have mixed up numerical simulations (Molecular Dynamics and Monte Carlo) together with analytical approaches (Boltzmann equation, hydrodynamics, stochastic processes).

From 2010, thanks to a FIRB-IDEAS grant, I have set up a laboratory for granular experiments where I have led a large part of my recent activity. A second line of research which I have been conducting in the last 6-7 years is the study, by means of information theory and agent-based numerical models, of the dynamics of language and of artificial communication systems.

From 2015 I started to be interested into active matter modelling, kinetic theories for microswimmers (e.g. bacteria) and aligning agents (e.g. birds), their characterization in terms of entropy production and distance from equilibrium. From 2020 I also started an experimental activity with sperms.

Academic and scientific career

since 1/4/2021: Research Director (“Dirigente di ricerca”, permanent) at CNR-ISC (Institute for Complex Systems at National Research Council), Rome

since 1/8/2018: Senior Researcher (“Primo ricercatore”, permanent) at CNR-ISC (Institute for Complex Systems at National Research Council), Rome

8/1/2014: Habilitation for both First and Second Grade Professorship (“Ordinario” and “Associato”), in Sector 02/A2 (Theoretical Physics of Fundamental Interactions)

11/12/2013: Habilitation for both First and Second Grade Professorship (“Ordinario” and “Associato”), in Sectors 02/B2 (Theoretical Physics of Matter)

16/7/2009 - 31/7/2018: Researcher (permanent) at the CNR-INFN-SMC, now CNR-ISC (Institute for Complex Systems at National Research Council), Rome

October 2008 - July 2009: Researcher and First Researcher (TD) at the CNR-INFN-SMC (Center for Statistical Mechanics and Complexity in the INFN institute of italian Center for National Research), Rome

January 2008-September 2008: Research fellowship from CNISM, at the Physics Dept. of “Sapienza” University, Rome

January 2006-December 2007: Research fellowship (from EU projects and PRIN) at the Physics Dept. of “Sapienza” University, Rome

January 2004-December 2005: “Marie-Curie” individual fellowship granted at the Laboratoire de Physique Theorique of the University Paris-Sud (Orsay, Paris)

January 2002-December 2003: Research fellowship with the Statistical Mechanics and Complexity Center of INFN, Rome

1999-2001: Ph.D. in Physics at “Sapienza” University of Rome (discussed on February 2002)

1998: Laurea in Physics at “Sapienza” University of Rome (mark: 110/110 cum laude)

Grants

February 2020: participant of INFN Iniziativa Specifica “FIELDTURB”

September 2018: principal investigator of a Lazioinnova research grant (150kEuro for 2 years)

June 2018: participant of a MAECI Italia-Israel bilateral research grant

October 2011: participant in the Prin project

September 2008 - December 2014: principal investigator of a FIRB-IDEAS project (1.2MEuro for 5 years)

2008: winner of the ERC Starting Grant 2007 (above the “threshold of excellence”, classified in the “reserve list”, not funded for insufficient budget)

January - December 2006: Marie-Curie European Re-Integration Grant (~ 24000 E. for 1 year)

Publications (summary): Scholar: 5182 citations, h-index 41; ISI: 3421 citations, h-index 33, ~ 135 publications on international peer-reviewed journals (PNAS, Phys. Rep., Phys. Rev. Lett., PLOS One, Sci. Rep., Europhys. Lett., Phys. Rev. E, J. Stat. Mech., J. Stat. Phys., Physica D, etc.), exclusive authorship of 1 book (“Transport and fluctuations in granular fluids”, edited in 2014 by Springer) and authorship with 3 co-authors of 1 book (“A Random Walk in Physics”, edited in 2021 by Springer).

Organisation and committees in international conferences

September 2021: “SR40 forty years of stochastic resonance” (Perugia; ~ 100 participants, scientific committee)

November 2019: “La genesi dei modelli: teoria, simulazioni e dati” (Rome, Accademia dei Lincei, Italy; ~ 100 participants)

September 2017: “Thermodynamics and Statistical Mechanics of Small Systems” (Rome, Italy; ~ 100 participants)

May 2015: “Statistical Mechanics of non-Hamiltonian systems” (Rome, Italy; ~ 40 participants)

September 2014: “Strolling on Chaos, Turbulence and Statistical Mechanics” (Rome, Italy; ~ 110 participants)
September 2013: “Large deviations and rare events in physics and biology” (Rome, Italy; ~ 90 participants)
July 2013: “Small system nonequilibrium fluctuations, dynamics and stochastics, and anomalous behavior” (Beijing, China, at Kavli-China institute, ~ 100 participants)
June 2012: “Non-equilibrium fluctuation-response relations” (Giglio, Italy; ~ 50 participants)
June 2012: “Quasi-fluids and quasi-solids: the dynamics of active and granular matter” (Parma, Italy; ~ 70 participants)
September 2010: “Anomalous Transport: from Billiards to Nanosystems” (Sperlonga, Italy; ~ 50 participants)

Talks and presentations: ~ 50 talks given at national and international conferences (~ 35 invited).

Other appointments

Appointed outstanding referee for APS in 2020
Referee for three Ph. D. thesis (at the University Roma Tre and at the Twente University)
Member (CNR delegate) in the commission for spaces in the Physics Department of Sapienza University
Evaluator for national scientific projects in Italy (FIRB, at MIUR)
Evaluator for national scientific projects in Belgium (FNRS)
Evaluator for national scientific projects in Chile and in Romania
Referee for scientific journals (PNAS, Phys. Rev. Lett, Phys. Rev. E, Europhys. Lett., JSTAT, J. Stat. Phys, others)
Reviewer for “Mathematical Reviews” (invited)
Distinguished Referee Europhysics Letters 2008

Teaching and supervision of students

I have been supervisor of 8 undergraduate thesis (dissertazione and tesi magistrale) and 4 Ph.D. students (Dario Villamaina, Alessandro Manacorda, Luca Cerino and Andrea Plati) at the Department of Physics of the Sapienza University of Rome (Italy), and 1 Ph. D. student (Paolo Visco) at the Paris-Sud University.

I have been supervisor for a 3-5 months stays of undergraduate students from the Ecole Normale Supérieure de Lyon (Camille Scalliet and Louis Combe).

From 2012 I teach a course for undergraduates on stochastic processes (Physics Department, Sapienza University)

2010-2012: Lectures on granular fluids for the Ph. D. course in physics (Univ. Sapienza)

2000 - 2002: Assistance to the Laboratory of Programming and Numerical Computation for the 1st year graduating students in Mathematics, in the Mathematics Department of the Sapienza University of Rome; Assistance to the Calculus Course for the 1st year graduating students (in Natural Sciences) in the Mathematics Department of the Sapienza University of Rome; Assistance in the course of "Probability calculus" for the 1st year graduating students, in the Mathematics Department of the Sapienza University of Rome; Twenty hours of basic mathematics lessons held in the Sapienza University of Rome, during the Preparation Courses for freshmen undergraduates.

Known languages: Italian, English, French