

CURRICULUM VITAE

(8/9/2021)

ALESSANDRO SARRACINO

ADDRESS

Dipartimento di Ingegneria,
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PERSONAL DETAILS

Gender: Male
Date of birth: 22nd of December, 1981
Place of birth: Naples, Italy
Present Citizenship: Italian
Civil Status: married, two children

EDUCATION AND ACADEMIC CAREER

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|-----------------|--|
| 2021 | National Scientific Qualification (ASN) for full professor in sectors 02/B2 and 02/A2. |
| 11/2019– | RTD-B Researcher at Dipartimento di Ingegneria, Università degli Studi della Campania “L. Vanvitelli”. |
| 06/2018–11/2019 | RTD-A Researcher at Dipartimento di Ingegneria, Università degli Studi della Campania “L. Vanvitelli”. |
| 2017 | National Scientific Qualification (ASN) for associate professor in sectors 02/B2 and 02/A2. |
| 12/2015–05/2018 | TD Researcher at ISC-CNR, Rome. |
| 12/2013–11/2015 | Research fellowship in the group of O. Bénichou at the LPTMC, Université Pierre et Marie Curie, Paris. |
| 12/2009–11/2013 | Research fellowship (from the GRANULARCHAOS project funded by MIUR) in the group of A. Puglisi and A. Vulpiani at the CNR-ISC and Department of Physics, University of Rome “Sapienza”, Italy. |

- 05/2009-12/2009 Research fellowship (from PRIN) at the Department of Mathematics and Informatics, University of Salerno, Italy.
- 01/2009 Ph.D. in Physics from the University of Salerno, Italy, with a Thesis on “Nonlinear fluctuation-dissipation relations: analytical derivation and numerical applications”. Thesis Advisor Professor Marco Zannetti.
- 10/2005 Laurea Degree in Physics from the University Federico II of Naples, Italy, with a Thesis on “Segregation and dynamic instabilities in granular mixtures”, with the mark 110/110 *cum laude*. Thesis Advisor Professor Antonio Coniglio.
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RESEARCH INTERESTS

Nonequilibrium Statistical Mechanics

Complex Systems

Anomalous Transport

SCIENTIFIC ACTIVITY

H-index: 18 (ISI WoS), 23 (Google Scholar)
Citations: 909 (ISI WoS), 1328 (Google Scholar)

53 publications in peer-reviewed journals (7 PRLs, 1 Phys. Rep.)

1 edited book

3 book chapters

5 publications in peer-reviewed conference proceedings

PUBLICATIONS IN PEER-REVIEWED JOURNALS

1. *Critical behaviour of the stochastic Wilson-Cowan model*
A. de Candia, A. Sarracino, I. Apicella, L. de Arcangelis
Plos Comput. Biol. **17**, e1008884 (2021)
2. *Stochastic thermodynamics of a piezoelectric energy harvester model*
L. Costanzo, A. Lo Schiavo, A. Sarracino, M. Vitelli
Entropy **23**, 677 (2021)
3. *Getting hotter by heating less: How driven granular materials dissipate energy in excess*
A. Plati, L. de Arcangelis, A. Gnoli, E. Lippiello, A. Puglisi, A. Sarracino
Phys. Rev. Research **3**, 013011 (2021)

4. *Fluctuation-Dissipation Relations in active matter systems*
L. Caprini, A. Puglisi, A. Sarracino
Symmetry **13**, 81 (2021)
5. *Role of inhibitory neurons in temporal correlations of critical and super-critical spontaneous activity*
D. Raimo, A. Sarracino, L. de Arcangelis
Physica A **565**, 125555 (2021)
6. *Predicting brain evoked response to external stimuli from temporal correlations of spontaneous activity*
A. Sarracino, O. Arviv, O. Shriki, and L. de Arcangelis
Phys. Rev. Research **2**, 033355 (2020)
7. *Diffusion properties of self-propelled particles in cellular flows*
L. Caprini, F. Cecconi, A. Puglisi, A. Sarracino
Soft Matter **16**, 5431 (2020)
8. *Condensation versus ordering: From the spherical models to Bose-Einstein condensation in the canonical and grand canonical ensemble*
A. Crisanti, A. Sarracino, M. Zannetti
Phys. Rev. Research **1**, 023022 (2019)
9. *On the fluctuation-dissipation relation in non-equilibrium and non-Hamiltonian systems*
A. Sarracino and A. Vulpiani
Chaos **29**, 083132 (2019)
10. *Probability Distributions with Singularities*
F. Corberi and A. Sarracino
Entropy **21**, e21030312 (2019)
11. *Induced and endogenous acoustic oscillations in granular faults*
L. de Arcangelis, E. Lippiello, M. Pica Ciamarra, and A. Sarracino
Phil.Trans. Royal Soc. A **377**, 0389 (2019)
12. *Tracer diffusion in crowded narrow channels*
O. Benichou, P. Illien, G. Oshanin, A. Sarracino, and R. Voituriez
J. Phys.: Condens. Matter **30**, 443001 (2018)
13. *Anomalous mobility of a driven active particle in a steady laminar flow* F. Cecconi, A. Puglisi, A. Sarracino, and A. Vulpiani
J. Phys.: Condens. Matter **30**, 264002 (2018)
14. *Nonequilibrium fluctuations and enhanced diffusion of a driven particle in a dense environment*
P. Illien, O. Benichou, G. Oshanin, A. Sarracino, R. Voituriez
Phys. Rev. Lett. **120**, 200606 (2018)
15. *Controlled viscosity in dense granular materials*
A. Gnoli, L. de Arcangelis, F. Giacco, E. Lippiello, M. Pica Ciamarra, A. Puglisi, A. Sarracino
Phys. Rev. Lett. **120**, 138001 (2018)

16. *Temperature in and out of equilibrium: A review of concepts, tools and attempts* A. Puglisi, A. Sarracino, A. Vulpiani
Physics Reports **709**, 1 (2017)
17. *About thermometers and temperature*
M. Baldovin, A. Puglisi, A. Sarracino, A. Vulpiani
J. Stat. Mech. (2017) 113202
18. *Anomalous force-velocity relation of driven inertial tracers in steady laminar flows*
F. Cecconi, A. Puglisi, A. Sarracino, A. Vulpiani
Eur. Phys. J. E **40**, 81 (2017)
19. *Self-propulsion against a moving membrane: Enhanced accumulation and drag force*
U. Marini Bettolo Marconi, A. Sarracino, C. Maggi and A. Puglisi
Phys. Rev. E **96**, 032601 (2017)
20. *Fourier's Law in a Generalized Piston Model*
L. Caprini, L. Cerino, A. Sarracino, and A. Vulpiani
Entropy **19**, 350 (2017)
21. *Heat fluctuations of Brownian oscillators in nonstationary processes: Fluctuation theorem and condensation transition*
A. Crisanti, A. Sarracino, and M. Zannetti
Phys. Rev. E **95**, 052138 (2017)
22. *Unified rheology of vibro-fluidized dry granular media: From slow dense flows to fast gas-like regimes*
A. Gnoli, A. Lasanta, A. Sarracino, A. Puglisi
Sci. Rep. **6**, 38604 (2016)
23. *Nonlinear response of inertial tracers in steady laminar flows: differential and absolute negative mobility*
A. Sarracino, F. Cecconi, A. Puglisi, A. Vulpiani
Phys. Rev. Lett. **117**, 174501 (2016)
24. *Nonlinear response and emerging nonequilibrium microstructures for biased diffusion in confined crowded environments*
O. Bénichou, P. Illien, G. Oshanin, A. Sarracino, R. Voituriez
Phys. Rev. E **93**, 032128 (2016)
25. *Diffusion and Subdiffusion of Interacting Particles on Comblike Structures*
O. Bénichou, P. Illien, G. Oshanin, A. Sarracino, R. Voituriez

- Phys. Rev. Lett. **115**, 220601 (2015)
26. *Coarsening in granular systems*
A. Baldassarri, A. Puglisi, A. Sarracino
Comptes Rendus Physique **16**, 291 (2015)
 27. *Microscopic theory for negative differential mobility in crowded environments*
O. Bénichou, P. Illien, G. Oshanin, A. Sarracino, R. Voituriez
Phys. Rev. Lett. **113**, 268002 (2014)
 28. *Nonequilibrium fluctuation-dissipation theorem and heat production*
E. Lippiello, M. Baiesi and A. Sarracino
Phys. Rev. Lett. **112**, 140602 (2014)
 29. *Nonequilibrium Brownian motion beyond the effective temperature*
A. Gnoli, A. Puglisi, A. Sarracino, A. Vulpiani
PLoS ONE **9**, e93720 (2014)
 30. *Fluctuations in partitioning systems with few degrees of freedom*
L. Cerino, G. Gradenigo, A. Sarracino, D. Villamaina, A. Vulpiani
Phys. Rev. E **89**, 042105 (2014)
 31. *Time asymmetry of the Kramers equation with nonlinear friction: fluctuation-dissipation relation and ratchet effect*
A. Sarracino
Phys. Rev. E **88**, 052124 (2013)
 32. *Rare events and scaling properties in field-induced anomalous dynamics*
R. Burioni, G. Gradenigo, A. Sarracino, A. Vezzani, A. Vulpiani
J. Stat. Mech. (2013) P09022
 33. *Fluctuation relations without uniform large deviations*
G. Gradenigo, A. Sarracino, A. Puglisi and H. Touchette
J. Phys. A: Math. Theor. **46**, 335002 (2013)
 34. *Non-equilibrium fluctuations in frictional granular motor: experiments and kinetic theory*
A. Gnoli, A. Sarracino, A. Petri, and A. Puglisi
Phys. Rev. E **87**, 052209 (2013)
 35. *Ratchet effect driven by Coulomb friction: the asymmetric Rayleigh piston*
A. Sarracino, A. Gnoli, and A. Puglisi

- Phys. Rev. E **87**, 040101(R) (2013)
36. *Brownian ratchet in a thermal bath driven by Coulomb friction*
A. Gnoli, A. Petri, F. Dalton, G. Gradenigo, G. Pontuale, A. Sarracino,
and A. Puglisi
Phys. Rev. Lett. **110**, 120601 (2013)
 37. *Entropy production in non-equilibrium fluctuating hydrodynamics*
G. Gradenigo, A. Sarracino, and A. Puglisi
J. Chem. Phys. **137**, 014509 (2012)
 38. *Einstein relation in superdiffusive systems*
G. Gradenigo, A. Sarracino, D. Villamaina, and A. Vulpiani
J. Stat. Mech. L06001 (2012)
 39. *Non-equilibrium fluctuations in a driven stochastic Lorentz gas*
G. Gradenigo, U. Marini Bettolo Marconi, A. Puglisi, and A. Sarracino
Phys. Rev. E **85**, 031112 (2012)
 40. *Dynamics of a massive intruder in a homogeneously driven granular fluid*
A. Puglisi, A. Sarracino, G. Gradenigo, and D. Villamaina
Granular Matter **14**, 235 (2012)
 41. *Structure factors in granular experiments with homogeneous fluidization*
A. Puglisi, A. Gnoli, G. Gradenigo, A. Sarracino, and D. Villamaina
J. Chem. Phys. **136**, 014704 (2012)
 42. *Non-equilibrium length in granular fluids: From experiment to fluctuating hydrodynamics*
G. Gradenigo, A. Sarracino, D. Villamaina, and A. Puglisi
Europhysics Letters **96**, 14004 (2011)
 43. *Fluctuating hydrodynamics and correlation lengths in a driven granular fluid*
G. Gradenigo, A. Sarracino, D. Villamaina, and A. Puglisi
J. Stat. Mech. P08017 (2011)
 44. *Estimate of temperature and its uncertainty in small systems*
M. Falcioni, D. Villamaina, A. Vulpiani, A. Puglisi, and A. Sarracino
Am. J. Phys. **79**, 777 (2011)
 45. *On anomalous diffusion and the out of equilibrium response function in one-dimensional models*

- D. Villamaina, A. Sarracino, G. Gradenigo, A. Puglisi, and A. Vulpiani
J. Stat. Mech. L01002 (2011)
46. *The ratchet effect in an ageing glass*
G. Gradenigo, A. Sarracino, D. Villamaina, T. S. Grigera and A. Puglisi
J. Stat. Mech. L12002 (2010)
47. *Irreversible dynamics of a massive intruder in dense granular fluids*
A. Sarracino, D. Villamaina, G. Gradenigo and A. Puglisi
Europhysics Letters **92**, 34001 (2010)
48. *Identification of the critical temperature from non-equilibrium time-dependent quantities*
E. Lippiello and A. Sarracino
Europhysics Letters **90**, 60001 (2010)
49. *Granular Brownian motion*
A. Sarracino, D. Villamaina, G. Costantini, and A. Puglisi
J. Stat. Mech. P04013 (2010)
50. *Fluctuations of two-time quantities and non-linear response functions*
F. Corberi, E. Lippiello, A. Sarracino, and M. Zannetti
J. Stat. Mech. P04003 (2010)
51. *Fluctuation-dissipation relations and field-free algorithms for the computation of response functions*
F. Corberi, E. Lippiello, A. Sarracino, and M. Zannetti
Phys. Rev. E **81**, 011124 (2010)
52. *Nonlinear response and fluctuation dissipation relations*
E. Lippiello, F. Corberi, A. Sarracino, and Marco Zannetti
Phys. Rev. E **78**, 041120 (2008)
53. *Nonlinear susceptibilities and the measurement of a cooperative length*
E. Lippiello, F. Corberi, A. Sarracino, and M. Zannetti
Phys. Rev. B **77**, 212201 (2008)

Edited Book

- *Thermodynamics and Statistical Mechanisn of Small Systems*, (Entropy, MDPI, Basel, 2018) A. Puglisi, A. Sarracino, A. Vulpiani, (Eds.)

Book chapters

1. *Out-of-equilibrium generalized fluctuation-dissipation relations*
G. Gradenigo, A. Puglisi, A. Sarracino, D. Villamaina, and A. Vulpiani
in “Nonequilibrium Statistical Physics of Small Systems: Fluctuation Relations and Beyond” (Wiley-VCH, Weinheim, 2013) R. Klages, W. Just, C. Jarzynski (Eds.)
2. *Large deviations of Brownian motors*
A. Sarracino and D. Villamaina
in “Large deviations in physics” Series: Lecture Notes in Physics (Springer, 2014) F. Cecconi, M. Cencini, A. Puglisi, D. Vergni and A. Vulpiani (Eds.)
3. *Active fluids within the unified coloured noise approximation*
U. Marini Bettolo Marconi, C. Maggi, and A. Sarracino
in “Flowing Matter” Series: Soft and Biological Matter (Springer, 2019) F. Toschi, M. Sega (Eds.)

Publications in peer-reviewed conference proceedings

1. *Coulomb friction driving Brownian motors*
A. Manacorda, A. Puglisi, A. Sarracino
Commun. Theor. Phys. **62**, 505 (2014)
2. *Scaling properties of field-induced superdiffusion in Continuous Time Random Walks*
R. Burioni, G. Gradenigo, A. Sarracino, A. Vezzani, A. Vulpiani
Commun. Theor. Phys. **62**, 514 (2014)
3. *Einstein relation in systems with anomalous diffusion*
G. Gradenigo, A. Sarracino, D. Villamaina, and A. Vulpiani
Acta Physica Polonica B **44**, 899 (2013)
4. *The out of equilibrium response function in sub-diffusive systems*
G. Gradenigo, A. Puglisi, A. Sarracino, A. Vulpiani and D. Villamaina
Physica Scripta **86**, 058516 (2012)
5. *Species segregation and dynamical instability of horizontally vibrated granular mixtures*
M. Pica Ciamarra, A. Sarracino, M. Nicodemi, and A. Coniglio
In Traffic and Granular Flow 2005, A. Schadschneider, T. Poschel, T.; Kühne, R.; Schreckenberg, M.; Wolf, D.E. (Eds.) (2007)

ORGANIZATION OF INTERNATIONAL WORKSHOPS

September 2017 “Thermodynamics and Statistical Mechanics of Small Systems”, Roma, Italy (with A. Puglisi and A. Vulpiani)

June 2012 “Non-equilibrium fluctuation-response relations”, Isola del Giglio (Gr), Italy (with G. Gradenigo and A. Puglisi)

CONFERENCES, TALKS & SUMMER SCHOOLS

- December 2019 **Talk** at “The XVIII Workshop on Statistical Mechanics and nonperturbative Field Theory”, Bari, Italy.
- June 2019 **Talk (invited)** at “Statistical Mechanics of Active Matter”, L’Aquila, Italy.
- October 2018 **Talk (invited)** at “Entropic Fluctuation Relations in Mathematics and Physics”, Montreal, Canada.
- May 2017 **Seminar** at University of Luxembourg, Luxembourg.
- May 2017 **Talk** at “Fluids and Structures: Interaction and Modeling”, Naples, Italy.
- November 2016 **Talk** at “Journées rhéologie des suspensions denses: du micron au millimètre”, Marseille, France.
- September 2016 **Talk** at “Meeting tematico ISC sulla diffusione”, Firenze, Italy.
- June 2016 **Talk** at “XXI Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi”, Parma, Italy.
- July 2015 “Non standard transport”, L’Aquila, Italy.
- May 2015 **Talk** at “IV Workshop on Dynamics in Viscous Liquids”, Montpellier, France.
- Avril 2015 **Seminar** at Physics Department of University of Rome Sapienza, Italy.
- February 2015 **Seminar** at Physics Department of University of Leuven, Belgium.
- January 2015 **Talk** at “Workshop on recent Developments In Non-Equilibrium Physics: Luxembourg out of Equilibrium”, Luxembourg.
- September 2014 “Strolling on Chaos, Turbulence and Statistical Mechanics”, Rome, Italy.
- September 2014 The Beg Rohu Summer School, “Nonequilibrium Statistical Mechanics and Active Matter”, France.
- November 2013 Poster at “Conference on Friction and Energy Dissipation in Man-made and Biological Systems”, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.
- September 2013 Poster at “Large deviations and rare events in physics and biology”, University of Rome Sapienza, Italy.

- July 2013 **Talk (invited)** at 7th IDMRCS, Barcelona, Spain.
- July 2013 **Talk** at “Small system nonequilibrium fluctuations, dynamics and stochasticity, and anomalous behavior”, KITPC, Beijing, China.
- April 2013 **Seminar** at Dipartimento di Fisica, University of Padua, Italy.
- March 2013 Poster (**Best poster session award**) at “38th Conference of the Middle European Cooperation in Statistical Physics”, Trieste, Italy.
- March 2013 **Seminar** at LPTMC, Université Pierre et Marie Curie Paris VI, France.
- November 2012 “Grandes déviations et systèmes de particules en interaction, états stationnaires hors équilibre”, IHP Paris, France.
- June 2012 **Talk (invited)** at “XVII Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi”, Parma, Italy.
- June 2012 “Non-equilibrium fluctuation-response relations”, Isola del Giglio (Gr), Italy.
- June 2012 “Frontiers in Statistical Physics and Complex Systems”, Catania, Italy.
- January 2012 **Seminar** at LPTHE, Université Pierre et Marie Curie Paris VI, France.
- January 2012 **Talk** at “Journées de Physique Statistique”, Paris, France.
- October 2011 “Foundations and Applications of Non-Equilibrium Statistical Mechanics”, Stockholm, Sweden.
- September 2011 **Talk** at the “ZCAM conference on Granular and Active Fluids”, Zaragoza, Spain.
- March 2011 Poster at “Workshop on Dynamics in Viscous Liquids III”, Roma, Italy.
- September 2010 Poster at “Anomalous Transport: from Billiards to Nanosystems”, Sperlonga, Italy.
- July 2010 **Talk** at the “XXIV IUPAP International Conference on Statistical Physics”, Cairns, Australia.
- June 2010 **Talk (invited)** at the “XV Convegno di Fisica Statistica”, Parma, Italy.
- September 2009 Poster at the International Summer School “Fundamental Problems in Statistical Physics XII”, Leuven, Belgium.
- May 2009 **Seminar** at ISC-CNR, University Sapienza Roma, Italy
- August–September 2007 “Les Houches Predoctoral School in Statistical Physics”
- September 2006 “IV Workshop on non equilibrium phenomena in supercooled fluids, glasses and amorphous materials”, Pisa, Italy.

PROFESSIONAL EXPERIENCE

- 2021– Member of the Topics Board of the journal Entropy - section "Non-equilibrium phenomena"
- 2021– Member of the Editorial Board of the journal Symmetry
- 2017 Guest editor (with A. Puglisi and A. Vulpiani) for the journal Entropy, special issue: "Thermodynamics and Statistical Mechanics of Small Systems"
- 2010– Referee of journal papers submitted to: Physical Review Letters; New Journal of Physics; Physical Review E; Physical Review A; Physical Review B; Europhysics Letters; Journal of Statistical Physics; Physica A; Journal of Statistical Mechanics; Journal of Physics A: Math. Theor.; Entropy; Symmetry; Comm. Nonlinear Sci. Num. Sim.

TEACHING

- 2020– Course of Stochastic Processes, 48 hours (6 CFU), at the Department of Physics, University of Campania "L. Vanvitelli".
- 2019– Course of Probability and Information, 48 hours (6 CFU), at the Department of Engineering, University of Campania "L. Vanvitelli".
- 2018– Course of Physics 2 (Electromagnetism), 48 hours (6 CFU), at the Department of Engineering, University of Campania "L. Vanvitelli".
- 2016–2017 Co-supervision of one master thesis at University of Rome Sapienza.
- 2015–2016 Co-supervision of one master thesis at University of Rome Sapienza.
- 2012–2013 Co-supervision of two master theses at University of Rome Sapienza.
- 02/2009–07/2009 Assistance in the course of "Physics" for the 1st year graduating students, in the Department Mathematics and Informatics of the University of Salerno.
- Spring 2008 Integrative lessons of Physics held in the University of Salerno for the 1st year graduating students.

COMPUTER SKILLS

C programming language

Linux, Unix

MATHEMATICA[®]

L^AT_EX typesetting package

LANGUAGE KNOWLEDGE

Italian	native
English	good (both written and spoken)
French	good (both written and spoken)