Gioia CARINCI

Curriculum Vitæ

PERSONAL INFORMATIONS

Surname:	Carinci
Name:	Gioia
Date of birth:	17-02-1982
Nationality:	Italian
Research Identifier:	Gioia Carinci - ORCID: 0000-0002-8364-5896

CURRENT POSITION

Nov 2022 - present: Associate Professor of Probability at:
Department of Physics, Informatics and Mathematics
University of Modena and Reggio Emilia

NATIONAL SCIENTIFIC ABILITATION

- 2018, Abilitazione Scientifica Nazionale alle funzioni di professore di II fascia – settore concorsuale 01/A3 – ANALISI MATEMATICA, PROBABILITÀ E STATISTICA MATEMATICA con validità dal 27/07/2018 al 27/07/2024.
- 2018, Abilitazione Scientifica Nazionale alle funzioni di professore di II fascia – settore concorsuale 01/A4 – FISICA MATEMATICA con validità dal 13/07/2018 al 13/07/2024.

ACADEMIC EDUCATION AND DEGREES

- Ph.D. in Mathematics
  July 2010, Department of Mathematics, L'Aquila University (Italy)
  PhD Supervisor: Errico Presutti
  Thesis Title: *Stochastic effects in critical regimes*
- Master Degree in Mathematics
  July 2006, Department of Mathematics, L'Aquila University (Italy)
  Grade: 110/110 *cum laude*
  Supervisor: Anna De Masi
  Thesis Title: *A variational study of nucleation problems and interface dynamics*
- Bachelor's Degree in Mathematics
  April 2004, Department of Mathematics, L'Aquila University (Italy)
  Grade: 110/110 *cum laude*
  Supervisor: Antonella Marini

PREVIOUS POSITIONS

Jan 2020 - Oct 2022:	RTD-B (Tenure-Track Assistant Professor) of Probability at: Department of Physics, Informatics and Mathematics University of Modena and Reggio Emilia
Oct 2015 - Dec 2019:	Assistant Professor of Probability at: Department of Applied Mathematics Delft University of Technology
Feb 2012 - Sep 2015:	Postdoc Fellow (Assegnista di Ricerca) at: Department of Physics, Informatics and Mathematics University of Modena and Reggio Emilia
Feb 2011 - Jan 2012:	Borsa di Ricerca e Formazione avanzata, Department of Mathematics University of Modena and Reggio Emilia
Oct - Dec 2010:	Visiting scholar at LATP, *Laboratoire d'Analyse Topologie et Probabilités* Aix Marseille University

PUBLICATION LIST

Books:

- Free Boundary Problems in PDEs and particle systems,
  with *A.De Masi, C.Giardinà, E.Presutti*,
  SpringerBriefs in Math.Phys. 2016
  http://www.springer.com/gp/book/9783319333694

Articles:

1. Nonconventional averages along arithmetic progressions and lattice spin systems,
   with *J.R.Chazottes, C.Giardinà, F.Redig*,
   Indag.Math. **23** 3 589-602, 2012

2. Langevin dynamics with a tilted periodic potential,
   with *S.Luckhaus*,
   J.Stat.Phys. **151** 5 870-895, 2013

3. Duality for Stochastic Models of Transport,
   with *C.Giardinà, C.Giberti, F.Redig*,
   J.Stat.Phys. **152** 4 657-697, 2013

4. Random Hysteresis Loops,
   Ann.Inst.H.Poincaré(B) **49** 2 307-339, 2013

5. Hydrodynamic limit in a particle system with topological interactions,
   with *A.De Masi, C.Giardinà, E.Presutti*,
   Arab.J.Math. **3** 381-417, 2014

6. Super-hydrodynamic limit in interacting particle systems,
   with *A.De Masi, C.Giardinà, E.Presutti*,
   J.Stat.Phys. **155** 5 867–887, 2014

7. Dualities in population genetics: a fresh look with new dualities,
with *C.Giardinà, C.Giberti, F.Redig*,
Stoc.Proc.Appl. **125** 3 941-969, 2015

8. Asymmetric stochastic transport models with $SU_q(1,1)$ symmetry,
with *C.Giardinà, F.Redig, T.Sasamoto*,
J.Stat.Phys. **163** 239-279, 2016

9. A generalized Asymmetric Exclusion Process with $U_q(sl_2)$ stochastic duality,
with *C.Giardinà, F.Redig, T.Sasamoto*,
Prob.Th.Relat.Fields **166** 887-933, 2016

10. Quantitative Boltzmann-Gibbs principle via orthogonal polynomial duality,
with *M.Ayala, F.Redig*,
J.Stat.Phys. **171** 6 980-999, 2018

11. Orthogonal dualities of Markov processes and unitary symmetries,
with *C.Franceschini, C.Giardinà, W.Groenewelt, F.Redig*,
SIGMA **15** 053, 2019

12. Stationary States in Infinite Volume with Non-zero Current,
with *C.Giardinà, E.Presutti*,
J.Stat.Phys **180** 1 366-397, 2020

13. Exact formulas for two interacting particles and applications in particle systems with duality,
with *C.Giardinà, F.Redig*,
Ann.Appl.Prob. **30** 4 1934-1970, 2020

14. Higher order fluctuation fields and orthogonal duality polynomials,
with *M.Ayala, F.Redig*,
El.J.Prob. **26** 1-35, 2021

15. Consistent particle systems and duality,
with *C.Giardinà, F.Redig*,
El.J.Prob. **26** 1-31, 2021

16. q-Orthogonal dualities for asymmetric particle systems,
with *C.Franceschini, W.Groenewelt*,
El.J.Probab. **26** 1-38, 2021

17. Condensation of SIP particles and sticky Brownian motion,
with *M.Ayala, F.Redig*,
J.Stat.Phys. **183** 3 1-42, 2021

18. Boundary driven Markov gas: duality and scaling limits,
with *S.Floreani, C.Giardinà, F.Redig*, (2021),
Ensaios Matemáticos, 2021

19. Duality for a boundary driven asymmetric model of energy transport,
with *F. Casini, C. Franceschini*,
J. Phys. A: Mathematical and Theoretical **57** (8), 085204, 1, 2024

20. Solvable stationary non equilibrium states,
with *C. Franceschini, D. Gabrielli, C. Giardinà, D. Tsagkarogiannis*,
J. Stat. Phys. **191** (1), 10, 2024

Preprint:

21. Global solutions of a free boundary problem via mass transport inequalities,
with *A. De Masi, C. Giardinà, E. Presutti*, (2015),
http://arxiv.org/abs/1402.5529

22. The open harmonic process: non-equilibrium steady state, pressure, density large deviation and additivity principle,
with *C. Franceschini, R. Frassek, C. Giardinà, F Redig*, (2023),
arXiv preprint arXiv:2307.14975

GRANTS

- Local responsible of the PRIN 2022 project *Emergence of condensation-like phenomena in interacting particle systems: kinetic and lattice models* funded by MUR, in collaboration with L'Aquila University (PI: Alessia Nota) and Roma La Sapienza University (local responsible: Giada Basile). Duration: sept. 2023- sept 2025.

- PI of the research project funded by GNFM (Gruppo Nazionale Fisica Matematica, Italy): *Non-equilibrium dynamics via current reservoirs*. Duration June 2014-June 2015.

- Scholarship *Borsa Regionale per attività di ricerca e trasferimento dei risultati della R&S (POR C3/IC1E)*, funded by Regione Abruzzo. Duration 2007-2008.

- Member of the FIRB-research project *Stochastic processes in interacting particle systems: duality, metastability and their applications* coordinated by Cristian Giardinà, funded by MIUR. Duration 2012-2015.

- Member of the research project *Competitions and cooperation in biological and social systems: the statistical mechanics approach*, coordinated by Cristian Giardinà, funded by UniMoRe and Cassa di Risparmio di Modena. Duration 2010-2012.

- Member of the PRIN-research project, *Dal microscopico al macroscopico: analisi di strutture complesse e applicazioni*, coordinated by Errico Presutti, funded by MIUR. Duration 2009-2010.

- Member of the PRIN-research project, *Fenomeni di grande scala in sistemi di molte particelle e microstrutture in meccanica dei continui*, coordinated by Errico Presutti, funded by MIUR. Duration 2007-2008.

- Project *Microscopic models for Free Boundary Problems* (P.I. Gioia Carinci, year 2016) -admitted to the selection procedure for the TOP2 Research Grant, funded by NWO (Dutch Research Agency). The proposal received the assessment A+ by all referees and has been admitted to the final selection stage (interview). The project was not funded due to lack of funds.

INTERNATIONAL ACTIVITIES

RESEARCH VISITS

Over the past years I have made several medium-term international research visits.

Jan - Feb 2020:	*CPHT – Ecole Polytechnique* - Palaiseau Cedex - France collaboration with J. René Chazottes
Feb 2019:	*GSSI – Gran Sasso Science Institute* - L'Aquila collaboration with Errico Presutti
June - July 2017:	*IHP - Institut Henri Poincaré* - Paris - France Trimester Program : Stochastic Dynamics out of Equilibrium
Jan - Mar 2015:	*IHP - Institut Henri Poincaré* - Paris - France Trimester Program : Disordered systems, random spatial processes and some applications
Mar - May 2014:	*Delft University of Technology* - The Netherlands collaboration with Frank Redig
Apr 2013:	*Delft University of Technology* - The Netherlands collaboration with Frank Redig
Jul-Aug 2012:	*HIM - Hausdorff Research Institute for Mathematics* - Bonn - Germany collaboration with Stephan Luckhaus
Apr-May 2011:	*University of Nijmegen* - The Netherlands collaboration with Frank Redig
Oct-Dec 2010:	*LATP - Laboratoire d'Analyse Topologie et Probabilités* *Université Aix Marseille* - France collaboration with Pierre Picco
May-Jul 2009:	*MPI - Max Plank Institute* - Leipzig - Germany collaboration with Stephan Luckhaus

INVITED PRESENTATIONS

Since 2007 I gave several invited lectures at international conferences, workshops and summer schools.

- **Invited Seminars at Workshops and Conferences:**
  - July 2021, Bernoulli-IMS 10th World Congress in Probability and Statistics, Organized Session 04: Interacting Particle Systems and Inclusion Process, Seoul
  - Apr 2021, Probability and Stochastic Analysis Seminar, Lisbon, (Joint session with Seminario Brasileiro de Probabilidade, IMPA)
  - May 2021, Seminars in Probability and Finance, Università degli Studi di Padova,
  - Sep 2019, XXI Congresso U.M.I., Pavia
  - June 2019, Seminar in PDE and Applications, Delft University of Technology, The Netherlands

- June 2019, Workshop Women in Probability, Technische Universitt Mnchen, Germany
- Nov 2018, Particle Systems and PDE's VII, Palermo, Italy
- Sep 2018, Young Women in Mathematical Physics 2018, HCM Bonn, Germany
- Apr 2018, Mark Kac Seminar, Utrecht, The Netherlands.
- Jan 2018, Workshop: Inhomogeneous Random Systems, IHP, Paris, France, *Particle Systems and Free Boundary Problems*.
- Dec 2017, Séminaire Hypatie, Marseille, France, *Inclusion process: two particles dynamics and applications in fluctuations theory*.
- July 2017, Trimester Program on *Stochastic Dynamics out of Equilibrium*, IHP, Paris, France.
- Mar 2016, YEP XIII, Eurandom, Eindhoven, The Netherlands.
- Sep 2015, Rencontres de Probabilites, Rouen, France.
- Aug 2015, 8th ICIAM, Beijing, China.
- Mar 2015, Workshop on *Interacting particle systems and non-equilibrium dynamics*, IHP, Paris, France.
- Mar 2014, YEP XI, EURANDOM, Eindhoven, Netherlands.
- Nov 2010, IV Workshop on Random Dynamical Systems, Bielefeld, Germany.
- Sep 2009, 5th Annual PhD Student Conference in Probability, MPI, Max Plank Institute, Leipzig, Germany.
- Feb 2009, Sviluppi Recenti in Fisica Matematica, University of L'Aquila.
- Sep 2007, XXXII Scuola estiva di Fisica Matematica, Ravello.

- **Invited Courses**

  - May 2019, Course on *Duality Theory and Applications*, Departamento de Matemática, Instituto Superior Técnico Lisboa, Portugal.
  - Sep 2014, XXXIX Scuola estiva di Fisica Matematica, Ravello, course on *Recurrence and transience via Fourier analysis*.
  - Aug 2013, XVII Brazilian School of Probability, Mambucaba, Brazil, *Stochastic Interacting Particles and Statistical Mechanics*.

In the Past years I was invited to speak in seminars in several universities such as CPHT, Ecole Polytechnique, FR; University of Reading, UK; Leiden University, NED; University of Roma Tor Vergata.

ORGANIZATIONAL ACTIVITY

- 2011-2015, organizer of the Mathematical Physics and Probability seminars at Modena University.
- 9-13 March 2013. Organizer of the poster-session of the Workshop: Interacting Particles Systems and Non-equilibrium Dynamics, Institut Henri Poincaré, Paris, Trimester Program: Disordered systems, random spatial processes and some applications.
- 2016-2019: organizer of the Probability and Statistics seminar series at Delft University of Technology.

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- Member of GNFM, National Group of Mathematical Physics.