

Marco Panero

Curriculum Vitæ

Present position

11.2014 – present **Associate Professor**, Department of Physics, University of Turin, Italy

Appointments, qualifications and education

07.2018 – 07.2029 Italian National Academic Qualification as Full Professor (ASN 02/A2)

03.2017 – 02.2022 Affiliate member of the Arnold-Regge Center, Turin

03.2016 – present Scientific association as Research Scientist for INFN (Italian Nuclear Physics Institute), Turin

01.2014 French National Academic Qualification as Lecturer/Associate Professor

01.2014 Italian National Academic Qualification as Associate Professor (ASN 02/A2)

10.2013 – 10.2014 Severo Ochoa Excellence fellow, Autonomous University of Madrid, Spain

10.2010 – 09.2013 Postdoctoral researcher, University of Helsinki, Finland

10.2008 – 09.2010 Postdoctoral researcher, ETH Zürich, Switzerland

01.2007 – 09.2008 Alexander von Humboldt fellow, University of Regensburg, Germany

11.2003 – 11.2006 Postdoctoral researcher, Dublin Institute for Advanced Studies, Ireland

10.2003 Ph.D. in Physics, University of Turin, Italy

07.2000 M.Sc. in Physics, first class honours, University of Turin, Italy

Scientific research

- Main research areas: Fundamental interactions and fields (PE2_1), Particle physics (PE2_2), Nuclear physics (PE2_3), Statistical physics (PE3_15)
- Principal Investigator for the CINECA INFN_SFT high-performance computing initiative (01.2017 – present)
- Scientific production summary: 101 publications (including 1 academic textbook and 49 articles in peer-reviewed journals). ORCID: 0000-0001-9477-3749

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Competitive research grants

2023 Participant member in the Italian PRIN "Progetti Di Ricerca Di Rilevante Interesse Nazionale – Bando 2022", prot. 2022TJFCYB (total allocation: 197 064 €; total number of participant members: 14)

2022 Participant member in the international project "Color Confinement and QCD Strings", funded by the Simons Foundation (total allocation for the Department of Physics: 512 000 €; total number of participant members from the Department of Physics: 2)

2022 Participant member in the Italian Research Center on HPC, Big Data and Quantum Computing – Spoke 1: Future HPC & Big Data (total allocation for the Department of Physics: 578 300 €; total number of participant members from the Department of Physics: 10)

2016 Competitive personal research grant from INFN, to hire a two-year postdoctoral researcher: 74 000 € plus financial support for travel

2008 Competitive personal research grant from INFN: 56 000 € plus financial support for travel

2006 Competitive personal research grant from the Alexander von Humboldt Foundation (Germany): 54 000 € plus financial support for travel

Scientific talks

- Selected invited plenary talks at conferences:
  - ALICE Muon Meeting 2017 (Monsummano Terme, Italy), 05.2017: *Lattice QCD predictions for heavy-ion collisions*
  - Lattice 2012, The XXX International Symposium on Lattice Field Theory (Cairns, Australia), 06.2012: *Recent results in large-N lattice gauge theories*
  - Extreme QCD 2010 (Bad Honnef, Germany), 06.2010: *Large-N thermodynamics*
- Invited research seminars:
  - Approximately 70 invited research seminars at international Universities and Research Institutes

Teaching

- *Applied physics* module of *Functioning of the human body* [MED3032] for Nursing Sciences B.Sc. students (2015 – present; 30 hours)
- *Nuclear physics at low and high temperatures* [FIS0082] for M.Sc. students (2022 – present; 24 hours)
- *Physics II* [MFN1247] for Mathematics B.Sc. students (2015 – present; 24 hours)
- *Introduction to group theory* [MFN0888] for M.Sc. students (2022 – present; 48 hours)
- *Introduction to the large-N limit* [FIS0077] for Ph.D. students (2017, 2019 – 2022; 20 hours)
- *Complements of mathematical methods for physics* [MFN0779] for M.Sc. students (2015 – 2021; 48 hours)
- *Introduction to lattice field theory* [FIS0090] for Ph.D. students (2015, 2018; 20 hours)
- *Mathematical Methods of Physics III* for M.Sc. students (University of Helsinki, Finland, 2011; 30 hours)
- *Introduction to Lattice QCD* for Ph.D. students (International Graduate School Bielefeld – Paris – Helsinki, GRK 881 and PACO, University of Helsinki, Finland, 2010; 6 hours)

- Tutor for the *Supersymmetry* course for M.Sc. students (ETH Zürich, Switzerland, 2009; 30 hours)
- Tutor for the *Advanced Quantum Field Theory* course for M.Sc. students (ETH Zürich, Switzerland, 2008; 30 hours)
- Tutor for the *Physics II* course for Mathematics B.Sc. students (University of Turin, 2003; 30 hours)
- Tutor for the *Physics I* course for Mathematics B.Sc. students (University of Turin, 2002; 30 hours)

Theses supervised

27. Antonio Smecca, Ph.D. 2023: *Inclusive semileptonic decays of heavy mesons and other challenging problems in lattice QCD*, approved cum laude

26. Marco Aliberti, M.Sc. 2023: *Quantum field theory on a highly symmetric lattice*, 110/110 cum laude

25. Paolo Garbarino, M.Sc. 2023: *Inclusive semileptonic decays of heavy mesons*, 110/110 cum laude and honourable mention

24. Antonino D'Anna, M.Sc. 2023: *Multiple scales on the lattice*, 110/110

23. Andrea Bulgarelli, M.Sc. 2022: *Entanglement entropy from non-equilibrium Monte Carlo calculations*, 110/110 cum laude and honourable mention

22. Andrea Stampiggi, M.Sc. 2022: *Form factors in the thermally deformed three-state bi-dimensional tricritical Potts model*, 110/110 cum laude

21. Niccolò Forzano, University of Milano-Bicocca, M.Sc. 2022: $\mathrm{Sp}(2N)$ *gauge theories at high temperature*, 110/110 cum laude (co-supervisor)

20. Vittorio Larotonda, B.Sc. 2021: *Derivazione delle equazioni complete dell'idrodinamica viscosa al secondo ordine dalla teoria cinetica* ("Derivation of the complete equations of relativistic hydrodynamics at second order from kinetic theory"), 110/110 cum laude

19. Fabrizio Caristo, M.Sc. 2021: *Study of the interquark potential at high temperature with lattice simulations*, 110/110 cum laude and honorable mention (co-supervisor)

18. Luca Ferrero, B.Sc. 2021: *Derivazione dell'idrodinamica relativistica dalla teoria cinetica* ("Derivation of relativistic hydrodynamics from kinetic theory"), 102/110

17. Paola Giovannetti, M.Sc. 2020: *Grand-canonical simulations of two dimensional systems*, 110/110 cum laude

16. Emanuele Di Salvo, M.Sc. 2020: *Lee-Yang zeros in quantum field theory*, 110/110

15. Pietro Butti, M.Sc. 2019: *Effective theories for relativistic fields at high temperature*, 110/110 cum laude

14. Matteo Favoni, M.Sc. 2019: *Duality transformation for scalar field theory on the lattice*, 110/110 cum laude

13. Leonardo Chimirri, M.Sc. 2018: *Renormalization of tensor currents from lattice QCD*, 110/110 cum laude and honorable mention

12. Emanuele Maunero, M.Sc. 2018: *Lattice study of the entanglement entropy in Yang-Mills theory*, 110/110 cum laude

11. Paolo Stornati, M.Sc. 2018: *Deconfinement phase transition in lattice quantum chromodynamics with very large quark masses*, 110/110 cum laude

10. Alessandro Nada, Ph.D. 2018: *Precision thermodynamics in non-Abelian gauge theories with non-equilibrium methods*, approved cum laude (co-supervisor)

9. Giulia Mercuri, B.Sc. 2017: *Aspetti caratterizzanti della fisica quantistica e l'origine quantistica dei fenomeni classici* ("Characterizing aspects of quantum physics and the quantum origin of classical phenomena"), 84/110

8. Olmo Francesconi, M.Sc. 2016: *Running coupling in Yang-Mills theory from the Schrödinger functional*, 110/110

7. Fabio Minniti, B.Sc. 2016: *Fondamenti della teoria delle matrici random e applicazioni in fisica* ("Foundations of random matrix theory and applications in physics"), 99/110

6. Carla Marchis, M.Sc. 2015: *The $O(1/m^2)$ heavy quark-antiquark potential at finite temperature*, 110/110 cum laude (co-supervisor)

5. Simone Bacchio (University of Turin, Italy), M.Sc. 2015: *The quark mass dependence in the quark-antiquark potential*, 110/110 cum laude (co-supervisor)

4. Arianna Toniato (University of Turin, Italy), M.Sc. 2015: *A study of interfaces in the three-dimensional Ising model*, 110/110 cum laude (co-supervisor)

3. Davide Vadacchino (University of Turin, Italy), M.Sc. 2012: *A numerical study of lattice QED in 2+1 dimensions*, 110/110 cum laude (co-supervisor)

2. Stefano Piemonte (University of Turin, Italy), M.Sc. 2011: *Termodinamica delle teorie di gauge su reticolo* ("Thermodynamics of lattice gauge theories"), 110/110 cum laude (co-supervisor)

1. Luca Castagnini (University of Turin, Italy), M.Sc. 2009: *Thermodynamics of $\mathrm{SU}(N)$ gauge theories in 2+1 dimensions*, 110/110 cum laude (co-supervisor)

Internal administrative responsibilities

- Member of the selection committee for the Physics Department research scholarship DFI_2022_17, University of Turin, 11.2022
- Secretary member of the Selection Board for admission to the Physics Ph.D. programme, University of Turin, 06.–07.2021
- Member of the selection committee for the "Alfredo Molinari" prize for M.Sc. theses in theoretical physics, INFN, Turin (2019–2020)
- Member of the selection committee for the Physics Department research scholarship 17-DF-2019, University of Turin, 11.2019
- Member of the Physics Ph.D. Programme Board, University of Turin (03.2019 – present)

- Member of the selection committee for the Physics Department research scholarship 09-DF-2018, University of Turin, 04.2018
- Member of the selection committee for a Visiting Professor position (Management Order 1596 of 22.05.2017), University of Turin, 07.2017
- Member of the Selection Board for admission to the the Physics and Astrophysics Ph.D. programme, University of Turin, 04.2017
- Member of the selection committee for the Physics Department research scholarship 03-DF-2017, University of Turin, 04.2017
- Member of the selection committee for the Physics Department postdoctoral scholarship 01-DF-2017, University of Turin, 02.2017
- Member of the selection committee for the INFN postdoctoral research grant 18594/2016, INFN, Turin,01.2017
- Member of the selection committee for the Physics Department postdoctoral scholarship 02-DF-2016, University of Turin, 02.2016
- Member of the selection committee for the Physics Department postdoctoral scholarship 04-DF-2016, University of Turin, 02.2016
- Member of the Physics Department Research Board, University of Turin (11.2015 – present)

Service for the community

- Conferences organized:
  - "Phase transitions in particle physics" workshop of the STRONG-2020 network, (Arcetri, Italy, 28.03.–01.04.2022)
  - "Quantum Gravity meets Lattice QFT" workshop (Trento, Italy, 03.–07.09.2018)
  - "New Frontiers in Theoretical Physics", the XXXVI Italian theoretical physics meeting (Cortona, Italy, 23.–26.05.2018)
  - "eNLarge Horizons" workshop (Madrid, Spain, 18.05.–05.06.2015)
  - "Turin Lattice Meeting 2014" workshop (Turin, Italy, 22.–23.12.2014)
  - "HoloGrav 2013" workshop of the European Science Foundation (Helsinki, Finland, 04.–08.03.2013)
- Scientific convener at conferences:
  - "Future Prospects" session of the II Italian Meeting on Physics with Heavy Ions at LHC (Turin, Italy, 09.–10.10.2017)
  - "Non-perturbative Quantum Field Theory and String Theory" session at the European Physics Society High Energy Physics 2013 conference (Stockholm, Sweden, 18.–24.07.2013)
- Chair of the Selection Panel for a type-B University Researcher position, University of Pisa, Italy (2022)
- Member of the Selection Panel for a type-A University Researcher position, University of Pisa, Italy (2018)
- External examiner for Ph.D. theses:
  - J. L. Dasilva Golan, Autonomous University of Madrid, Spain, 09.2023 (thesis supervisor: M. García Pérez)
  - S. Singh, University of Parma, Italy, 10.2022 (thesis supervisor: F. Di Renzo)
  - M. Cardinali, University of Pisa, Italy, 02.2022 (thesis supervisor: M. D'Elia)
  - J. Holligan, Swansea University, United Kingdom, 09.2021 (thesis supervisors: B. Lucini and M. Piai)
  - C. Marchis, University of Graz, Austria, 08.2018 (thesis supervisor: C. Gattringer)

  - F. Cuteri, University of Calabria, Italy, 02.2016 (thesis supervisor: A. Papa)
- Internal examiner for Ph.D. theses:
  - M. Motta, University of Turin, Italy, 05.2021 (thesis supervisor: W. M. Alberico; thesis co-supervisor: A. Beraudo)
  - D. Vadacchino, University of Turin, Italy, 09.2016 (thesis supervisor: M. Caselle)
- Application reviewer for:
  - US National Science Foundation (since 01.2014)
  - Royal Society, United Kingdom (since 01.2022)
  - Dutch Research Council (since 08.2019)
  - Israel Science Foundation (since 03.2021)
  - Italian National Agency for the Evaluation of the University System and of the Research Quality (since 07.2016)
  - Italian "Rita Levi Montalcini" Program for Young Researchers (since 11.2023)
  - Italian SuperComputing Resource Allocation Interdisciplinary Laboratory for Advanced Simulation initiatives of the CINECA supercomputing center, Italy (since 10.2022)
  - Partnership for Advanced Computing in Europe "PRACE" & EuroHPC, European Union (since 04.2016)
  - DiRAC HPC of the Science and Technology Facilities Council, United Kingdom (since 11.2019)
  - LinkSCEEM/Cy-Tera, Cyprus (since 10.2015)
- Member of the Editorial Board of the International Journal of Modern Physics A (since 02.2021)
- Member of the Editorial Board of Modern Physics Letters A (since 02.2021)
- Guest editor for the International Journal of Modern Physics A (2016)
- Journal reviewer for more than 30 peer-reviewed scientific journals
- Science popularization and outreach:
  - Author of a science popularization article on the anomalous magnetic dipole moment of the muon (04.2021), published online at https://bit.ly/3mrzn74
  - Invited speaker at a science popularization event in Bra, Italy, on the value of scientific culture for society (10.2018, in Italian)
  - Invited speaker for a science popularization lecture at the second-level college of science "Giolitti/Gandino" in Bra, Italy, on science and culture in the contemporary world (10.2018, in Italian)
  - Invited speaker for a science popularization talk in the "A Glass of Physics" event series, organized by A.I.S.F., the Italian Association of Physics Students, in Turin, Italy, on strongly coupled physical systems, from statistical mechanics to elementary particle physics (06.2018, in Italian)
  - Invited speaker for a science popularization lecture at the "Hackmeeting 0x14" in Venaus, Italy, on an introduction to quantum physics (06.2017, in Italian)
  - Invited speaker for a science popularization lecture for high-school students at the "Scuola di Fisica 2017" organized by the University of Turin, Italy, on the fundamental constituents of matter (04.2017, in Italian)
  - Invited speaker for a science popularization lecture, sponsored by Cassa di Risparmio di Bra Foundation, at the second-level college of science "Giolitti/Gandino" in Bra, Italy, on the arrow of time (02.2016, in Italian)
  - Author of a science popularization article on the discovery of the Higgs boson (07.2012, in Italian), published online at http://bit.ly/2p3ynLu