

Claudio Bonati

April 24, 2024

Personal data

- Born the 20/11/1982 in La Spezia (Italy).
- Language: italian (mother tongue), english, written french.

Education

Bachelor thesis defended the 17/10/2004 at Pisa University. Thesis title “The mathematical structure of quantum mechanics”, supervisor prof. L. Bracci (110/110 cum laude).

Master thesis defended the 24/07/2007 at Pisa University. Thesis title “The chiral transition in QCD with three flavours”, supervisor prof. A. Di Giacomo (110/110 cum laude).

Winner of a PhD grant at Pisa University (2008-2010).

PhD thesis defended the 17/02/2011 at Pisa University. Thesis title “Confinement, deconfinement and monopoles in gauge theories”, supervisor prof. A. Di Giacomo.

Work experience

INFN post-doc grant on the research theme “Lattice QCD on GPU card” (call 14314 of 8/03/2011) starting the 5/09/2011 (for two years).

INFN post-doc grant on the research theme “Research in theoretical nuclear and subnuclear physics, field theory and statistical mechanics” (call 15422 of 15/01/2013) starting the 5/09/2013 (for two years).

Post-doc grant at Pisa University on the research theme “Quantum field theory from fundamental interactions to cold atoms” starting the 15/09/2015 (for one year).

Post-doc grant at Firenze University on the research theme “Physics of relativistic strongly interacting fluids” starting the 01/10/2016 (for one year).

Type A researcher (junior) at Pisa University since 01/10/2017.

Type B researcher (senior) at Pisa University since 30/04/2020.

Associate professor at Pisa University since 30/04/2023.

Teaching activity

2011-2015 Teaching assistant for the course “Fisica 3” (Physics 3) for the third year of the bachelor degree in Physics (relativistic electromagnetism, radiation-matter interaction, nuclear and subnuclear physics, prof. I. Bombaci and F. Costantini).

2017-2020 “Fisica 3” (Physics 3) for the third year of the bachelor degree in Physics (scattering, relativistic electromagnetism, radiation-matter interaction, with prof. G. Batignani).

2017-2020 “Meccanica classica” (Classical Mechanics) for the second year of the bachelor degree in Physics (analytical mechanics, special relativity, statistical mechanics, with prof. M. D’Elia).

2020-2021 “Fisica ed Elementi di Radioprotezione” (Physics and elements of radioprotection) and “Elementi di Radiobiologia” (Elements of radiobiology) for the first year of the bachelor degrees in “Professioni sanitarie della riabilitazione” and “Tecniche della prevenzione nell’Ambiente e nei luoghi di lavoro” (subgroups of the medical sciences degrees).

2020- “Meccanica quantistica” (Quantum Mechanics) for the third year of the bachelor degree in Physics (with prof P. Rossi up to 2021/22, then with prof. L. Gualtieri).

2021- “Fisica 3” (Physics 3) for the third year of the bachelor degree in Physics (scattering, relativistic electromagnetism, radiation-matter interaction, with prof. G. Batignani).

2023- “Metodi Numerici della Fisica” for the first year of the master degree in Physics (modules “Introduction to Markov Chain Monte-Carlo and applications to statistical mechanics”, “Applications of Monte-Carlo methods to the study of path-integrals in quantum mechanics”, “Path-integral simulations in quantum field theory”).

Supervisor of 149 bachelor thesis, cosupervisor of 2 master thesis in physics and supervisor of 8 master thesis in physics.

Conference organization

Member of the local organizing committee:

GPU Computing in High Energy Physics, Pisa (Italy), September 10-12, 2014.

Extreme QCD 2017 - The 15th international workshop on QCD in eXtreme conditions, Pisa (Italy), June 25-28, 2017.

Research projects responsibilities

Principal investigator of the ISCRA B project (call IsB18) “Topological properties of trace deformed Yang-Mills theories” at CINECA (5.5 millions of core-hours, from 30 november 2018 to 30 november 2019).

Principal investigator of the ISCRA B project (call IsB20) “Trace deformation on the edge” at CINECA (3.5 millions of core-hours, from 9 october 2018 to 9 october 2020).

Principal investigator of the PRIN 2022 project “Emerging gauge theories: critical properties and quantum dynamics” (identifier 20227JZKWP) by Ministry of University and Research (total 210 Keuro, from 28 september 2023 to 27 september 2025).

Administrative tasks

03/07/2019-29/04/2023 Researchers’ representative in “Giunta” of the Physics Department of Pisa University.

01/12/2020- Member of “Commissione Scientifica d’area 02” (Scientific Commission for the physics research area) of Pisa University.

01/06/2023- National coordinator of the INFN research project NPQCD.

Research interests

Non perturbative physics of gauge theories: monopoles and their relation with confinement, topological properties, θ dependence, flux tubes, critical properties at phase transitions. Lattice study of the QCD phase diagram and QCD vacuum properties, QCD at finite density and in presence external magnetic fields. Statistical physics and critical phenomena of classical spin systems.

Publications

Published papers

1. C. Bonati, G. Cossu, M. D’Elia, A. Di Giacomo *Phase diagram of the lattice $SU(2)$ Higgs model* Nucl. Phys. B **828**, 390 (2010) [[arXiv:0911.1721](#)].
2. C. Bonati, A. Di Giacomo, L. Lepori, F. Pucci *Monopoles, abelian projection and gauge invariance* Phys. Rev. D **81**, 085022 (2010) [[arXiv:1002.3874](#)].
3. C. Bonati, A. Di Giacomo, M. D’Elia *Detecting monopoles on the lattice* Phys. Rev. D **82**, 094509 (2010) [[arXiv:1009.2425](#)].

4. C. Bonati, M. D'Elia *Three-dimensional, three state Potts model in a negative external field* Phys. Rev. D **82**, 114515 (2010) [[arXiv:1010.3639](#)].
5. C. Bonati, G. Cossu, M. D'Elia, F. Sanfilippo *Roberge-Weiss endpoint in $N_f = 2$ QCD* Phys. Rev. D **83**, 054505 (2011) [[arXiv:1011.4515](#)].
6. M. Fagotti, C. Bonati, D. Logoteta, P. Marconcini, M. Macucci *Armchair graphene nanoribbons: PT -symmetry breaking and exceptional points without dissipation* Phys. Rev. B **83**, 241406(R) (2011) [[arXiv:1102.2129](#)].
7. C. Bonati *Finite temperature effective string corrections in $(3+1)D$ $SU(2)$ lattice gauge theory* Phys. Lett. B **703**, 376 (2011) [[arXiv:1106.5920](#)].
8. C. Bonati, G. Cossu, M. D'Elia, P. Incardona *QCD simulations with staggered fermions on GPUs* Comput. Phys. Commun. **183**, 853 (2012) [[arXiv:1106.5673](#)].
9. C. Bonati, G. Cossu, M. D'Elia, A. Di Giacomo *Disorder parameter of dual superconductivity in QCD revisited* Phys. Rev. D **85**, 065001 (2012) [[arXiv:1111.1541](#)].
10. C. Bonati, M. D'Elia, H. Panagopoulos, E. Vicari *Change of θ dependence in $4D$ $SU(N)$ gauge theories across the deconfinement transition* Phys. Rev. Lett. **110**, 252003 (2013) [[arXiv:1301.7640](#)].
11. C. Bonati, M. D'Elia *Phase diagram of the $4D$ $U(1)$ model at finite temperature* Phys. Rev. D **88**, 065025 (2013) [[arXiv:1305.3564](#)].
12. C. Bonati, M. D'Elia, M. Mariti, F. Negro, F. Sanfilippo *Magnetic Susceptibility of Strongly Interacting Matter across Deconfinement* Phys. Rev. Lett. **111**, 182001 (2013) [[arXiv:1307.8063](#)].
13. C. Bonati, M. D'Elia *The Maximal Abelian Gauge in $SU(N)$ Gauge Theories and Thermal Monopoles for $N=3$* Nucl. Phys. B **877**, 233 (2013) [[arXiv:1308.0302](#)].
14. C. Bonati, M. D'Elia, M. Mariti, F. Negro, F. Sanfilippo *Magnetic susceptibility and equation of state of $N_f = 2 + 1$ QCD with physical quark masses* Phys. Rev. D **89**, 054506 (2014) [[arXiv:1310.8656](#)].
15. C. Bonati, M. D'Elia *Comparison of the gradient flow with cooling in $SU(3)$ pure gauge theory* Phys. Rev. D **89**, 105005 (2014) [[arXiv:1401.2441](#)].
16. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, F. Sanfilippo *Anisotropy of the quark-antiquark potential in a magnetic field* Phys. Rev. D **89**, 114502 (2014) [[arXiv:1403.6094](#)].
17. C. Bonati, M. D'Elia, E. Vicari *Universal scaling effects of a temperature gradient at first-order transitions* Phys. Rev. E **89**, 062132 (2014) [[arXiv:1403.4744](#)].

18. D. Logoteta, P. Marconcini, C. Bonati, M. Fagotti, M. Macucci *High-performance solution of the transport problem in a graphene armchair structure with a generic potential* Phys. Rev. E **89**, 063309 (2014) [arXiv:1401.1178].
19. C. Bonati, P. de Forcrand, M. D'Elia, O. Philipsen, F. Sanfilippo *Chiral phase transition in two-flavor QCD from imaginary chemical potential* Phys. Rev. D **90**, 074030 (2014) [arXiv:1408.5086].
20. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, F. Sanfilippo *Curvature of the pseudo-critical line in QCD* Phys. Rev. D **90**, 114025 (2014) [arXiv:1410.5758].
21. C. Bonati *Topology and θ dependence in finite temperature G_2 lattice gauge theory* JHEP **2015:03** 006 (2015) [arXiv:1501.01172].
22. C. Bonati, M. D'Elia, A. Rucci *Heavy quarkonia in strong magnetic fields* Phys. Rev. D **92**, 054014 (2015) [arXiv:1506.07890].
23. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, F. Sanfilippo *Curvature of the chiral pseudo-critical line in QCD: continuum extrapolated results* Phys. Rev. D **92**, 054503 (2015) [arXiv:1507.03571].
24. C. L. Manganelli, P. Pintus, C. Bonati *Modeling of strain-induced Pockels effect in Silicon* Optics Express **23**, 28649 (2015) [arXiv:1507.06589].
25. C. Bonati, M. D'Elia, A. Scapellato *θ dependence in $SU(3)$ Yang-Mills theory from analytic continuation* Phys. Rev. D **93**, 025028 (2016) [arXiv:1512.01544].
26. C. Bonati, M. D'Elia, M. Mariti, G. Martinelli, M. Mesiti, F. Negro, F. Sanfilippo, G. Villadoro *Axion phenomenology and θ -dependence from $N_f = 2 + 1$ lattice QCD* JHEP **2016:03** (2016) 155 [arXiv:1512.06746].
27. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, F. Sanfilippo *Roberge-Weiss endpoint at the physical point of $N_f = 2 + 1$ QCD* Phys. Rev. D **93**, 074504 (2016) [arXiv:1602.01426].
28. C. Bonati, M. D'Elia, P. Rossi, E. Vicari *θ dependence of 4D $SU(N)$ gauge theories in the large- N limit* Phys. Rev. D **94** 085017 (2016) [arXiv:1607.06360].
29. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, A. Rucci, F. Sanfilippo *Magnetic field effects on the static quark potential at zero and finite temperature* Phys.Rev. D **94** 094007 (2016) [arXiv:1607.08160].
30. C. Bonati, E. Calore, S. Coscetti, M. D'Elia, M. Mesiti, F. Negro, S. F. Schifano, G. Silvi, R. Tripiccone *Design and optimization of a portable LQCD Monte Carlo code using OpenACC* Int. J. Mod. Phys. C **28** 1750063 (2017) [arXiv:1701.00426].

31. C. Bonati, M. D'Elia, M. Mariti, M. Mesiti, F. Negro, A. Rucci, F. Sanfilippo *Screening masses in strong external magnetic fields* Phys. Rev. D **95**, 074515 (2017) [[arXiv:1703.00842](#)].
32. C. Bonati, E. Calore, M. D'Elia, M. Mesiti, F. Negro, F. Sanfilippo, S. F. Schifano, G. Silvi, R. Tripiccione *Portable multi-node LQCD Monte Carlo simulations using OpenACC* Int. J. Mod. Phys. C **29**, 1850010 (2018) [[arXiv:1801.01473](#)].
33. M. Andreoli, C. Bonati, M. D'Elia, M. Mesiti, F. Negro, A. Rucci, F. Sanfilippo *Gauge-invariant screening masses and static quark free energies in $N_f = 2 + 1$ QCD at non-zero baryon density* Phys. Rev. D **97**, 054515 (2018) [[arXiv:1712.09996](#)].
34. C. Bonati, M. D'Elia, *Topological critical slowing down: Variations on a toy model* Phys. Rev. E **98**, 013308 (2018) [[arXiv:1709.10034](#)].
35. C. Bonati, S. Calì, M. D'Elia, M. Mesiti, F. Negro, A. Rucci, F. Sanfilippo *Effects of a strong magnetic field on the QCD flux tube* Phys. Rev. D **98**, 054501 (2018) [[arXiv:1807.01673](#)].
36. C. Bonati, M. Cardinali, M. D'Elia *θ dependence in trace deformed $SU(3)$ Yang-Mills theory: a lattice study* Phys.Rev. D **98**, 054508 (2018) [[arXiv:1807.06558](#)].
37. C. Bonati, M. D'Elia, F. Negro, F. Sanfilippo, K. Zambello *Curvature of the pseudocritical line in QCD: Taylor expansion matches analytic continuation* Phys. Rev. D **98**, 054510 (2018) [[arXiv:1805.02960](#)].
38. C. Bonati, M. D'Elia, G. Martinelli, F. Negro, F. Sanfilippo, A. Todaro *Topology in full QCD at high temperature: a multicanonical approach* JHEP **2018:11**, 170 (2018) [[arXiv:1807.07954](#)].
39. C. Bonanno, C. Bonati, M. D'Elia *Topological properties of CP^{N-1} models in the large- N limit* JHEP **2019:01**, 3 (2019) [[arXiv:1807.11357](#)].
40. C. Bonati, E. Calore, M. D'Elia, M. Mesiti, F. Negro, F. Sanfilippo, S. F. Schifano, G. Silvi, R. Tripiccione *Roberge-Weiss endpoint and chiral symmetry restoration in $N_f = 2 + 1$ QCD* Phys. Rev. D **99**, 014502 (2019) [[arXiv:1807.02106](#)].
41. C. Bonati, P. Rossi *The topological susceptibility of two-dimensional $U(N)$ gauge theories* Phys. Rev. D **99**, 054503 (2019) [[arXiv:1901.09830](#)].
42. N. Battelli, C. Bonati *Color flux tubes in $SU(3)$ Yang-Mills theory: an investigation with the connected correlator* Phys. Rev. D **99**, 114501 (2019) [[arXiv:1903.10463](#)].
43. C. Bonati, P. Rossi *Topological effects in continuum two-dimensional $U(N)$ gauge theories* Phys. Rev. D **100**, 054502 (2019) [[arXiv:1908.07476](#)].

44. C. Bonati, A. Pelissetto, E. Vicari *Phase diagram, symmetry breaking, and critical behavior of three-dimensional lattice multiflavor scalar chromodynamics* Phys. Rev. Lett. **123**, 232002 (2019) [arXiv:1910.03965].
45. C. Bonati, A. Pelissetto, E. Vicari *Three-dimensional lattice multiflavor scalar chromodynamics: interplay between global and gauge symmetries* Phys. Rev. D **101**, 034505 (2020) [arXiv:2001.01132].
46. C. Bonati, M. Cardinali, M. D'Elia, F. Mazziotti *θ -dependence and center symmetry in Yang-Mills theories* Phys. Rev. D **101**, 034508 (2020) [arXiv:1912.02662].
47. C. Bonati, A. Pelissetto, E. Vicari *Two-dimensional multicomponent Abelian-Higgs lattice models* Phys. Rev. D **101**, 034511 (2020) [arXiv:1912.01315].
48. C. Bonati, A. Pelissetto, E. Vicari *Universal low-temperature behavior of two-dimensional lattice scalar chromodynamics* Phys. Rev. D **101**, 054503 (2020) [arXiv:2001.07386].
49. G. Clemente, M. Cardinali, C. Bonati, E. Calore, L. Cosmai, M. D'Elia, A. Gabbana, D. Rossini, F. S. Schifano, R. Tripicciono, D. Vadacchino *Quantum computation of thermal averages in the presence of a sign problem* Phys. Rev. D **101**, 074510 (2020) [arXiv:2001.05328].
50. C. Bonati, S. Morlacchi *Flux tubes and string breaking in three dimensional $SU(2)$ Yang-Mills theory* Phys. Rev. D **101**, 094506 (2020) [arXiv:2003.07244].
51. C. Bonati, A. Pelissetto, E. Vicari *Three-dimensional phase transitions in multiflavor lattice scalar $SO(N_c)$ gauge theories* Phys. Rev. E **101**, 062105 (2020) [arXiv:2003.08160].
52. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Asymptotic low-temperature behavior of two-dimensional RP^{N-1} models* Phys. Rev. D **102**, 034513 (2020) [arXiv:2006.13061].
53. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Asymptotic low-temperature critical behavior of two-dimensional multiflavor lattice $SO(N_c)$ gauge theories* Phys. Rev. D **102**, 034512 (2020) [arXiv:2006.16046].
54. C. Bonati, A. Pelissetto, E. Vicari *Higher-charge three-dimensional compact lattice Abelian-Higgs models* Phys. Rev. E **102**, 062151 (2020) [arXiv:2011.04503].
55. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Berezinskii-Kosterlitz-Thouless transitions in two-dimensional lattice $SO(N_c)$ gauge theories with two scalar flavors* Phys. Rev. D **103**, 014510 (2021) [arXiv:2010.09412].
56. C. Bonati, A. Pelissetto, E. Vicari *Lattice Abelian-Higgs model with non-compact gauge fields* Phys. Rev. B **103**, 085104 (2021) [arXiv:2010.06311].

57. C. Bonati, M. Cardinali, M. D'Elia, M. Giordano, F. Mazziotti *Reconfinement, localization and thermal monopoles in $SU(3)$ trace-deformed Yang-Mills theory* Phys. Rev. D **103**, 034506 (2021) [[arXiv:2012.13246](#)].
58. C. Bonanno, C. Bonati, M. D'Elia *Large- N $SU(N)$ Yang-Mills theories with milder topological freezing* JHEP **2021:03** 111 (2021) [[arXiv:2012.14000](#)].
59. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Two-dimensional lattice $SU(N_c)$ gauge theories with multiflavor adjoint scalar fields* JHEP **2021:05** 018 (2021) [[arXiv:2103.12708](#)].
60. C. Bonati, A. Pelissetto, E. Vicari *Lattice gauge theories in the presence of a linear gauge-symmetry breaking* Phys. Rev. E **104**, 014140 (2021) [[arXiv:2106.02503](#)].
61. C. Bonati, A. Pelissetto, E. Vicari *Breaking of the gauge symmetry in lattice gauge theories* Phys. Rev. Lett. **127**, 091601 (2021) [[arXiv:2104.09892](#)].
62. C. Bonati, M. Caselle, S. Morlacchi *The unreasonable effectiveness of effective string theory: the case of the 3d $SU(2)$ Higgs model* Phys. Rev. D **104**, 054501 (2021) [[arXiv:2106.08784](#)].
63. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Three-dimensional lattice $SU(N_c)$ gauge theories with multiflavor scalar fields in the adjoint representation* Phys. Rev. B **104**, 115166 (2021) [[arXiv:2106.15152](#)].
64. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Phase diagram and Higgs phases of 3D lattice $SU(N_c)$ gauge theories with multiparameter scalar potentials* Phys. Rev. E **104**, 064111 (2021) [[arXiv:2110.01657](#)].
65. C. Bonati, A. Pelissetto, E. Vicari *Critical behaviors of lattice $U(1)$ gauge models and three-dimensional Abelian-Higgs gauge field theory* Phys. Rev. B **105**, 085112 (2022) [[arXiv:2201.01082](#)].
66. C. Bonati, A. Pelissetto, E. Vicari *Multicritical point of the three-dimensional Z_2 gauge Higgs model* Phys. Rev. B **105**, 165138 (2022) [[arXiv:2112.01824](#)].
67. C. Bonati, A. Franchi *Color-flavor reflection in the continuum limit of two-dimensional lattice gauge theories with scalar fields* Phys. Rev. E **105**, 054117 (2022) [[arXiv:2203.06979](#)].
68. C. Bonati, A. Pelissetto, E. Vicari *Scalar gauge-Higgs models with discrete Abelian symmetry groups* Phys. Rev. E **105**, 054132 (2022) [[arXiv:2204.02907](#)].
69. C. Bonati, A. Pelissetto, E. Vicari *Three-dimensional monopole-free CP^{N-1} models: Behavior in the presence of a quartic potential* J. Stat. Mech. **2206** (2022) 6, 063206 [[arXiv:2202.04614](#)].

70. A. Athenodorou, C. Bonanno, C. Bonati, G. Clemente, F. D'Angelo, M. D'Elia, L. Maio, G. Martinelli, F. Sanfilippo, A. Todaro *Topological susceptibility of $N_f = 2 + 1$ QCD from staggered fermions spectral projectors at high temperatures* JHEP **2022:10** 197 (2022) [[arXiv:2208.08921](#)].
71. C. Bonati, N. Francini *Non-compact lattice Higgs model with Abelian discrete gauge groups: phase diagram and gauge symmetry enlargement* Phys. Rev. B **107** 035106 (2023) [[arXiv:2211.03590](#)].
72. C. Bonati, A. Franchi, A. Pelissetto, E. Vicari *Chiral critical behavior of 3D lattice fermionic models with quartic interactions* Phys. Rev. D **107**, 034507 (2023) [[arXiv:2212.13932](#)].
73. C. Bonati, A. Pelissetto, E. Vicari *Gauge fixing and gauge correlations in noncompact Abelian gauge models* Phys. Rev. D **108**, 014517 (2023) [[arXiv:2304.14366](#)].
74. C. Bonati, A. Pelissetto, E. Vicari *The Coulomb Higgs phase transition of three-dimensional lattice Abelian-Higgs gauge models with noncompact gauge variables and gauge fixing* Phys. Rev. E **108**, 044125 (2023) [[arXiv:2305.15236](#)].
75. C. Bonati, A. Pelissetto, E. Vicari *Abelian Higgs gauge theories with multicomponent scalar fields and multiparameter scalar potentials* Phys. Rev. B **108**, 245154 (2023) [[arXiv:2310.08504](#)].
76. R. Aiudi, C. Bonanno, C. Bonati, G. Clemente, M. D'Elia, L. Maio, D. Rossini, S. Tirone, K. Zambello *Quantum Algorithms for the computation of quantum thermal averages at work* Phys. Rev. D **108**, 114509 (2023) [[arXiv:2308.01279](#)].
77. C. Bonati, A. Pelissetto, E. Vicari *Diverse universality classes of the topological deconfinement transitions of three-dimensional noncompact lattice Abelian-Higgs models* Phys. Rev. D **109**, 034517 (2024) [[arXiv:2308.00101](#)].
78. C. Bonati, A. Pelissetto, E. Vicari *Deconfinement transitions in three-dimensional compact lattice Abelian Higgs models with multiple-charge scalar fields* Phys. Rev. E **109**, 044146 (2024) [[arXiv:2402.06374](#)].

Published papers (non research)

1. C. Bonati *Variations on the magnetic torque acting on a wire*. Eur. J. Phys. **33** 987 (2012) [[arXiv:1205.1035](#)].
2. C. Bonati *The Peierls argument for higher dimensional Ising models*. Eur. J. Phys. **35** 035002 (2014) [[arXiv:1401.7894](#)].

Preprints

1. C. Bonanno, C. Bonati, M. Papace, D. VDACCHINO *The θ -dependence of the Yang–Mills spectrum from analytic continuation* [[arXiv:2402.03096](#)], Accepted for publication on JHEP.
2. C. Bonati, A. Pelissetto, E. Vicari *Strong-coupling critical behavior in three-dimensional lattice Abelian gauge models with charged N -component scalar fields and $SO(N)$ symmetry* [[arXiv:2403.12758](#)].
3. C. Bonati, A. Pelissetto, E. Vicari *Three-dimensional \mathbb{Z}_2 -gauge N -vector models* [[arXiv:2404.07050](#)].

Invited talks at conferences

1. “Tricritical points in field theory and statistical mechanics: from Potts models to finite density QCD”, New Frontiers in Lattice Gauge Theory, Firenze (Italy), August 27 - September 28, 2012.
2. “Across the deconfinement”, Critical Point and Onset of Deconfinement 2016 (CPOD 2016), Wrocław (Poland), May 30 - June 4, 2016.
3. “The computational challenges of Lattice Quantum Chromodynamics”, Perspectives of GPU computing in Science, Roma (Italy), September 26-28, 2016.
4. “Axion phenomenology from Lattice QCD”, Workshop on Axion Physics and Experiments, Frascati (Italy), March 27-28, 2017.
5. “The topological properties of QCD at high temperature: problems and perspectives”, 35th International Symposium on Lattice Field Theory Granada (Spain), June 19-24, 2017.
6. “QCD phase diagram at small μ/T ”, ECT* Workshop “Phase diagram of strongly interacting matter: From Lattice QCD to Heavy-Ion Collision Experiments”, Trento (Italy), November 27 - December 1, 2017.
7. “Topology and θ dependence in nonabelian gauge theories: recent results from the lattice”, 15th Workshop on Non-Perturbative Quantum Chromodynamics, Paris, 11-14 June, 2018.
8. “Some aspects of color confinement in lattice gauge theories”, Current Problems in Theoretical Physics (PAFT) 2019, XXV Edition, Vietri sul Mare (Italy), 13-17 April, 2019.
9. Roundtable on “QCD Topology and Axions”, The XVth Quark confinement and the Hadron spectrum conference, Stavanger (Norway), 1-6 August, 2022.

Talks at conferences

1. “Non abelian Bianchi identities, monopoles and gauge invariance” (talk), The XXVIII International Symposium on Lattice Filed Theory (Lattice 2010), Villasimius (Italy), June 14-19, 2010.
2. “Toward a well defined monopole creation operator” (poster), The XXVIII International Symposium on Lattice Filed Theory (Lattice 2010), Villasimius (Italy), June 14-19, 2010.
3. “Staggered fermions simulations on GPUs” (poster), The XXVIII International Symposium on Lattice Filed Theory (Lattice 2010), Villasimius (Italy), June 14-19, 2010.
4. “The magnetic susceptibility in QCD” (talk), 31st International Symposium on Lattice Field Theory (Lattice 2013), Mainz (Germany), July 29 - August 3, 2013.
5. “The θ dependence of $SU(N)$ gauge theories at finite temperature” (talk), XXXIV Convegno Nazionale di Fisica Teorica, Cortona (Italy), May 28 - 31, 2014.
6. “Properties of strong interactions in strong magnetic fields” (talk), Strong and Electroweak Matter (Sewm 2014), Lausanne (Switzerland), July 14 - 18, 2014.
7. “Pseudocritical line from Lattice QCD and comparison with freeze-out curves” (talk) Incontro sulla fisica con ioni pesanti a LHC, Bologna (Italy), May 26 - 27, 2015.
8. “ θ dependence in the deconfined phase of QCD” (talk), XXXV Convegno Nazionale di Fisica Teorica, Firenze (Italy), May 18 - 20, 2016
9. “ θ dependence in the large N limit” (talk), 34th International Symposium on Lattice Field Theory (Lattice 2016), Southampton (UK), 24-30 July 2016
10. “ θ dependence in the deconfined phase of QCD” (talk), The 14th International workshop on QCD in eXtreme conditions (XQCD 2016), Plymouth (UK), Aug. 1-3, 2016
11. “High temperature topological susceptibility in QCD: results and open problems” (talk) ECT* Workshop “Gauge Topology: from Lattice to Colliders”, Trento (Italy), 7-11 November 2016.
12. “From QCD to cosmology: theta dependence, axions and dark matter” (talk) QFC2017 - Quantum gases, fundamental interactions and cosmology, Pisa (Italy), 25-27 October 2017.

13. “The critical line of QCD at small baryon density” (talk) The 16th International Conference on QCD in Extreme Conditions (XQCD 2018) Frankfurt (Germany), 21-23 May 2018.
14. “Topological susceptibility in QCD at high temperature: a status report” (talk) ECT* Workshop “Gauge topology 3: from lattice to colliders” Trento (Italy), 28 May - 1 June, 2018.
15. “Critical properties of three-dimensional lattice multiflavor scalar chromodynamics” (talk) SM& FT 2019 The XVIII Whorkshop on Statistical Mechanics and Nonperturbative Field Theory, Bari, 11-13 December 2019.
16. “Lattice scalar electrodynamics with noncompact gauge fields” (talk) Comp-Phys20 21st International NTZ-Workshop on New Developments in Computational Physics, Leipzig, 3 - 5 December 2020 (online).
17. “Global symmetry breaking in gauge theories: the case of multiflavor scalar chromodynamics” (talk) 38th International Symposium on Lattice Field Theory, LATTICE2021, Zoom/Gather@Massachusetts Institute of Technology, 26-30 July 2021 (online).
18. “Topological susceptibility in high temperature QCD: a new investigation with spectral projectors” (talk) The XVth Quark confinement and the Hadron spectrum conference, Stavanger (Norway), 1-6 August, 2022.

Participation to outreach events

1. “Il calcolo delle masse degli adroni (e cosa sono gli adroni)”, Linux Day 2011, 22 October 2011, Pisa.
2. “Computer e quark”, BRIGHT2019 (Notte dei Ricercatori) “Speaker’s Corner: pillole di Scienza”, 27 September 2019, Pisa.
3. “Fisica e probabilità: introduzione ai metodi Monte Carlo e applicazioni in fisica statistica” Seminari di Fisica, IV edizione 2020/2021 - “Scholé” cultural association in collaboration with Liceo Scientifico “Volta” in Reggio Calabria, 7-9 April 2021 (online).