

List of Publications

Francesco Piazza

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Review Articles

1. F. Mivehvar, F. Piazza, T. Donner, H. Ritsch, “Many-body physics with ultracold atoms in optical resonators”, [arXiv:2102.04473](#), to appear in *Advances in Physics*.

Preprints

6. “Multimode-Floquet-Polariton Superradiance”, C. H. Johansen, J. Lang, F. Piazza, [arXiv:2011.12309](#)
5. “ ω/T scaling and IR/UV-mixing in Ising-nematic quantum critical metals”, B. Frank and F. Piazza, [arXiv:2011.07076](#)
4. “Many-body Hierarchy of Dissipative Timescales in a Quantum Computer”, O.-E. Sommer, F. Piazza, D. J. Luitz, [arXiv:2011.08853](#)
3. “Non-BCS-Type Enhancement of Superconductivity from Long-Range Photon Fluctuations”, A. Chakraborty and F. Piazza, [arXiv:2008.06513](#)
2. “Cavity-induced quantum spin liquids”, A. Chiochetta, D. Kiese, F. Piazza, S. Diehl, [arXiv:2009.11856](#)
1. “Cooperatively-enhanced precision of hybrid light-matter sensors”, A. Niezgoda, J. Chwedenczuk, T. Wasak, F. Piazza, [arXiv:2007.13649](#)

Journal articles

44. “Quantum-Zeno Fermi-Polaron”, T. Wasak, R. Schmidt, F. Piazza, accepted in *Phys. Rev. Res.*, [arXiv:1912.06618](#)
43. “Interaction-induced transparency for strong-coupling polaritons”, J. Lang, D. E. Chang, and F. Piazza, *Phys. Rev. Lett.* **125**, 133604 (2020)
42. “Hierarchy of relaxation timescales in local random Liouvillians”, K. Wang, F. Piazza, D. J. Luitz, *Phys. Rev. Lett.* **124**, 100604 (2020)
41. “Emergent Quasicrystalline Symmetry in Light-Induced Quantum Phase Transitions”, F. Mivehvar, H. Ritsch, F. Piazza, *Phys. Rev. Lett.* **123**, 210604 (2020)
40. “Nonequilibrium diagrammatic approach to strongly interacting photons”, J. Lang, D. E. Chang, and F. Piazza, *Phys. Rev. A* **102**, 033720 (2020)
39. “Time crystallinity in dissipative Floquet systems”, A. Lazarides, S. Roy, F. Piazza, R. Moessner, *Phys. Rev. Res.* **2**, 022002(R) (2020)

38. “Crystalline droplets with emergent topological color-charge in many-body systems with sign-changing interactions”, P. Karpov, F. Piazza, *Phys. Rev. A* **100**, 061401(R) (2019)
37. “Exceptional points and the topology of quantum many-body spectra”, D. J. Luitz, F. Piazza, *Phys. Rev. Res.* **1**, 033051 (2019)
36. “Hofstadter butterfly in a cavity-induced dynamic synthetic magnetic field”, E. Colella, F. Mivehvar, F. Piazza, H. Ritsch, *Phys. Rev. B* **100**, 224306 (2019)
35. “Topological soliton-polaritons in 1D systems of light and fermionic matter”, K. A. Fraser and F. Piazza, *Nat. Comm. Phys.* **2**, 48 (2019)
34. “Cavity-Quantum-Electrodynamical Toolbox for Quantum Magnetism”, F. Mivehvar, H. Ritsch, and F. Piazza, *Phys. Rev. Lett.* **122**, 113603 (2019)
33. “Multipartite entanglement dynamics in a regular-to-ergodic transition: Quantum Fisher information approach”, K. Gietka, J. Chwedenczuk, T. Wasak, F. Piazza *Phys. Rev. B* **99**, 064303 (2019);
32. “Breaking of Goldstone modes in a two-component Bose-Einstein condensate”, A. Recati, F. Piazza *Phys. Rev. B* **99**, 064505 (2019)
31. “Non-Fermi liquid at the FFLO quantum critical point”, D. Pimenov, I. Mandal, F. Piazza, M. Punk, *Phys. Rev. B* **98**, 024510 (2018)
30. “Aging dynamics in quenched noisy long-range quantum Ising models”, J. C. Halimeh, M. Punk, F. Piazza, *Phys. Rev. B* **98**, 045111 (2018)
29. “Driven-Dissipative Supersolid in a Ring Cavity”, F. Mivehvar, S. Ostermann, F. Piazza, H. Ritsch, *Phys. Rev. Lett.* **120**, 123601 (2018)
28. “Disorder-Driven Density and Spin Self-Ordering of a Spinor Bose-Einstein Condensate in a Cavity”, F. Mivehvar, F. Piazza, H. Ritsch, *Phys. Rev. Lett.* **119**, 063602 (2017)
27. “Superradiant Topological Peierls Insulator inside an Optical Cavity”, F. Mivehvar, H. Ritsch, F. Piazza, *Phys. Rev. Lett.* **118**, 073602 (2017)
26. “Collective excitations and supersolid behavior of bosonic atoms inside two crossed optical cavities”, J. Lang, F. Piazza, W. Zwerger, *New J. Phys.* **19**, 123027 (2017)
25. “Probing and characterizing the growth of a crystal of ultracold bosons and light”, S. Ostermann, F. Piazza, H. Ritsch, *New J. Phys.* **19**, 125002 (2017)
24. “Quantum-enhanced interferometry with cavity QED-generated non-classical light”, K. Gietka, T. Wasak, J. Chwedenczuk, F. Piazza, H. Ritsch, *Eur. Phys. J. D* **71**, 273 (2017)
23. “Critical Relaxation with Overdamped Quasi-Particles in Driven-Dissipative Systems”, J. Lang, F. Piazza, *Phys. Rev. A* **94**, 033628 (2016)
22. “Spontaneous crystallization of light and ultracold atoms”, S. Ostermann, F. Piazza, H. Ritsch, *Phys. Rev. X* **6**, 021026 (2016)
21. “Self-organised limit-cycles, chaos and phase-slippage with a superfluid inside an optical resonator”, F. Piazza, H. Ritsch, *Phys. Rev. Lett.* **115**, 163601 (2015)
20. “Self-ordered stationary states of driven quantum degenerate gases in optical resonators”, R. M. Sandner, W. Niedenzu, F. Piazza, H. Ritsch, *Europhys. Lett.* **111**, 53001 (2015)
19. “FFLO strange metal and quantum criticality in two dimensions: theory and experimental evidence in organic superconductors”, F. Piazza, W. Zwerger, P. Strack, *Phys. Rev. B* **93**, 085112 (2016)

18. “Parity Symmetry Breaking and Topological Phases in a Superfluid Ring”, X. Zhang, F. Piazza, W. Li, A. Smerzi, *Phys. Rev. A* **94**, 063601 (2016)
17. “Instability of the superfluid flow as black-hole lasing effect”, S. Finazzi, F. Piazza, M. Abad, A. Smerzi, A. Recati, *Phys. Rev. Lett.* **114**, 245301 (2015)
16. “Phase-slips and vortex dynamics in Josephson oscillations between Bose-Einstein condensates”, M. Abad, M. Guilleumas, R. Mayol, F. Piazza, D. M. Jezek, A. Smerzi, *Europhys. Lett.* **109**, 40005 (2015)
15. “Quantum kinetics of ultracold fermions coupled to an optical resonator”, F. Piazza and P. Strack, *Phys. Rev. A* **90**, 043823 (2014)
14. “Umklapp Superradiance with a Collisionless Quantum Degenerate Fermi Gas”, F. Piazza and P. Strack, *Phys. Rev. Lett.* **112**, 143003 (2014)
13. “Bose-Einstein Condensation versus Dicke-Hepp-Lieb Transition in an Optical Cavity”, F. Piazza and P. Strack, W. Zwerger, *Ann. of Phys.* **339**, 135 (2013)
12. “Critical velocity for a toroidal Bose-Einstein condensate flowing through a barrier”, F. Piazza, L. A. Collins, A. Smerzi, *J. Phys. B: At. Mol. Opt. Phys.* **46**, 095302 (2013)
11. “Multipath interferometer with ultracold atoms trapped in an optical lattice”, J. Chwedeńczuk, F. Piazza, A. Smerzi, *Phys. Rev. A* **87**, 033607 (2013)
10. “Sub shot-noise interferometry from measurements of the one-body density”, J. Chwedeńczuk, P. Hyllus, F. Piazza, A. Smerzi, *New J. Phys.* **14**, 093001 (2012)
9. “Phase Estimation from Atom Position Measurements”, J. Chwedeńczuk, F. Piazza, A. Smerzi, *New J. Phys.* **13**, 065023 (2011)
8. “Instability and Vortex Rings Dynamics in a Three-Dimensional Superfluid Flow Through a Constriction”, F. Piazza, L. A. Collins, A. Smerzi, *New J. Phys.* **13**, 043008 (2011)
7. “Dynamics of a tunable superfluid junction”, L. J. LeBlanc, A. B. Bardou, J. McKeever, M. H. T. Extavour, D. Jervis, J. H. Thywissen, F. Piazza, A. Smerzi, *Phys. Rev. Lett.* **106**, 025302 (2010)
6. “Phase Estimation With Interfering Bose-Condensed Atomic Clouds”, J. Chwedeńczuk, F. Piazza, A. Smerzi, *Phys. Rev. A* **82**, 051601(R) (2010)
5. “Rabi Interferometry and Sensitive Measurement of the Casimir-Polder Force with Ultra-Cold Gases”, J. Chwedeńczuk, L. Pezzé, F. Piazza, A. Smerzi, *Phys. Rev. A* **82**, 032104 (2010)
4. “Current-phase relation of a Bose-Einstein condensate flowing through a weak link”, F. Piazza, L. A. Collins, A. Smerzi, *Phys. Rev. A* **81**, 033613 (2010)
3. “Critical velocity of superfluid flow through single-barrier and periodic potentials”, G. Watanabe, F. Dalfovo, F. Piazza, L. P. Pitaevskii, S. Stringari, *Phys. Rev. A* **80**, 053602 (2009)
2. “Vortex-induced phase-slip dissipation in a toroidal Bose-Einstein condensate flowing through a barrier”, F. Piazza, L. A. Collins, A. Smerzi, *Phys. Rev. A* **80**, 021601(R) (2009)
1. “Macroscopic Superpositions of Phase States with Bose-Einstein condensates”, F. Piazza, L. Pezzé and A. Smerzi, *Phys. Rev. A* **78**, 051601(R) (2008)

Highlights

5. Cover page of “Physical Review Letters”, [Volume 124, Issue 10 \(2020\)](#)

4. Cover page of “Physical Review Letters”, [Volume 123, Issue 21 \(2019\)](#)
3. Synopsis on “APS-Physics” [May 24, 2016](#)
2. Cover page of “Physical Review Letters”, [Volume 115, Issue 16 \(2015\)](#)
1. Research Highlights on “Nature Physics”, [Nat. Phys. 4, 903 \(2008\)](#);

Book Contributions

1. F. Piazza, L. A. Collins, and A. Smerzi, chapter contribution to the book “[Physics of Quantum Fluids - New Trends and hot topics in atomic and polariton condensates](#)”, Springer (2013)