

LIST OF PUBLICATIONS

David Petrosyan

Papers in Refereed Journals (82)

1. A. F. Tzortzakakis, D. Petrosyan, M. Fleischhauer, K. Mølmer, *Microscopic dynamics and an effective Landau-Zener transition in the quadiabatic preparation of spatially ordered states of Rydberg excitations*, Phys. Rev. A **106**, 063302 (2022)
2. C. D. Mink, D. Petrosyan, M. Fleischhauer, *Hybrid discrete-continuous truncated Wigner approximation for driven, dissipative spin systems*, Phys. Rev. Research **4**, 043136 (2022)
3. A. F. Tzortzakakis, A. Katsaris, N. E. Palaiodimopoulos, P. A. Kalozoumis, G. Theocharis, F. K. Diakonou, D. Petrosyan, *Topological edge-states of the PT -symmetric Su-Schrieffer-Heeger model: An effective two-state description*, Phys. Rev. A **106**, 023513 (2022)
4. A. Curko, P. Domokos, D. Petrosyan, A. Vukics, *Collection efficiency of optical photons generated from microwave excitations of a Bose-Einstein condensate*, Phys. Rev. A **105**, 053708 (2022)
5. A. E. Allahverdyan, D. Petrosyan, *Dissipative search of an unstructured database*, Phys. Rev. A **105**, 032447 (2022)
6. M. Kaiser, C. Glaser, L. Y. Ley, J. Grimm, H. Hattermann, D. Bothner, D. Koelle, R. Kleiner, D. Petrosyan, A. Günther, J. Fortágh, *Cavity driven Rabi oscillations between Rydberg states of atoms trapped on a superconducting atom chip*, Phys. Rev. Research **4**, 013207 (2022)
7. P. A. Kalozoumis, D. Petrosyan, *Self-organized PT -symmetry of exciton-polariton condensate in a double-well potential*, Appl. Sci. **11**, 7372 (2021)
8. K. Orfanakis, A. F. Tzortzakakis, D. Petrosyan, P. G. Savvidis, and H. Ohadi, *Ultralong temporal coherence in optically trapped exciton-polariton condensates*, Phys. Rev. B **103**, 235313 (2021)
9. A.E. Allahverdyan, K.V. Hovhannisyanyan, D. Petrosyan, *Dynamical symmetrization of the state of identical particles*, Proc. R. Soc. A **477**, 20200911 (2021)
10. A. Curko, P. Domokos, A. Vukics, T. Bækkegaard, N.T. Zinner, J. Fortágh, D. Petrosyan, *Optimal collection of radiation emitted by a trapped atomic ensemble*, EPJ Quantum Technology **8**, 11 (2021)
11. D. Petrosyan, K. Mølmer, *Collective emission of photons from dense, dipole-dipole interacting atomic ensembles*, Phys. Rev. A **103**, 023703 (2021)
12. M. Stecker, R. Nold, L.-M. Steinert, J. Grimm, D. Petrosyan, J. Fortágh, A. Günther, *Controlling the dipole blockade and ionization rate of Rydberg atoms in strong electric fields*, Phys. Rev. Lett. **125**, 103602 (2020)
13. P. A. Kalozoumis, G. M. Nikolopoulos, D. Petrosyan, *Coherent population oscillations and an effective spin-exchange interaction in a PT symmetric polariton mixture*, EPL (Europhys. Lett.) **129**, 37003 (2020)
14. K. S. Christensen, S. E. Rasmussen, D. Petrosyan, N. T. Zinner, *Coherent router for quantum networks with superconducting qubits*, Phys. Rev. Research **2**, 013004 (2020)

15. T. Bækkegaard, L. B. Kristensen, N. J. S. Loft, C. K. Andersen, D. Petrosyan, N. T. Zinner, *Realization of efficient quantum gates with a superconducting qubit-qutrit circuit*, Sci. Rep. **9**, 13389 (2019)
16. D. Petrosyan, K. Mølmer, J. Fortágh, M. Saffman, *Microwave to optical conversion with atoms on a superconducting chip*, New J. Phys. **21**, 073033 (2019)
17. D. Petrosyan, K. Mølmer, *Deterministic free-space source of single photons using Rydberg atoms*, Phys. Rev. Lett. **121**, 123605 (2018)
18. F. Letscher, D. Petrosyan, *Mobile bound states of Rydberg excitations in a lattice*, Phys. Rev. A **97**, 043415 (2018)
19. L. F. Buchmann, K. Mølmer, D. Petrosyan, *Controllability in tunable chains of coupled harmonic oscillators*, Phys. Rev. A **97**, 042111 (2018)
20. L. Sárkány, J. Fortágh, and D. Petrosyan, *Faithful state transfer between two-level systems via an actively cooled finite-temperature cavity*, Phys. Rev. A **97**, 032341 (2018)
21. F. Letscher, D. Petrosyan, M. Fleischhauer, *Many-body dynamics of holes in a driven, dissipative spin chain of Rydberg superatoms*, New J. Phys. **19**, 113014 (2017)
22. D. Petrosyan, F. Motzoi, M. Saffman, K. Mølmer, *High-fidelity Rydberg quantum gate via a two-atom dark state*, Phys. Rev. A **96**, 042306 (2017); Editors' Suggestion
23. D. Petrosyan, *Dipolar exchange induced transparency with Rydberg atoms*, New J. Phys. **19**, 033001 (2017)
24. L. F. Buchmann, K. Mølmer, D. Petrosyan, *Creation and transfer of non-classical states of motion using Rydberg dressing of atoms in a lattice*, Phys. Rev. A **95**, 013403 (2017); Editors' Suggestion
25. O. Marchukov, A. G. Volosniev, M. Valiente, D. Petrosyan, N. T. Zinner, *Quantum spin transistor in a Heisenberg spin chain*, Nature Commun. **7**, 13070 (2016)
26. N. J. S. Loft, O. V. Marchukov, D. Petrosyan, N. T. Zinner, *Tunable self-assembled spin chains of strongly interacting cold atoms for demonstration of reliable quantum state transfer*, New J. Phys. **18**, 045011 (2016)
27. D. Petrosyan, K. Mølmer and M. Fleischhauer, *On the adiabatic preparation of spatially-ordered Rydberg excitations of atoms in a one-dimensional optical lattice by laser frequency sweeps*, J. Phys. B **49**, 084003 (2016)
28. D. Petrosyan, M. Saffman and K. Mølmer, *Grover search algorithm with Rydberg-blockaded atoms: Quantum Monte Carlo simulations*, J. Phys. B **49**, 094004 (2016)
29. L. Sárkány, J. Fortágh, and D. Petrosyan, *Long-range quantum gate via Rydberg states of atoms in a thermal microwave cavity*, Phys. Rev. A **92**, 030303(R) (2015)
30. D. Petrosyan, D. D. Bhaktavatsala Rao and K. Mølmer, *Filtering single atoms from Rydberg blockaded mesoscopic ensembles*, Phys. Rev. A **91**, 043402 (2015)
31. G. Kurizki, P. Bertet, Y. Kubo, K. Mølmer, D. Petrosyan, P. Rabl, and J. Schmiedmayer, *Quantum technologies with hybrid systems*, PNAS **112**, 3866 (2015)

32. A.G. Volosniev, D. Petrosyan, M. Valiente, D.V. Fedorov, A.S. Jensen, and N.T. Zinner, *Engineering the dynamics of effective spin-chain models for strongly interacting atomic gases*, Phys. Rev. A **91**, 023620 (2015)
33. D. Petrosyan and K. Mølmer, *Binding potentials and interaction gates between microwave-dressed Rydberg atoms*, Phys. Rev. Lett. **113**, 123003 (2014)
34. D. Petrosyan and G.M. Nikolopoulos, *Assessing the number of atoms in a Rydberg-blockaded mesoscopic ensemble*, Phys. Rev. A **89**, 013419 (2014)
35. D. Petrosyan, *Two-dimensional crystals of Rydberg excitations in a resonantly driven lattice gas*, Phys. Rev. A **88**, 043431 (2013)
36. D. Petrosyan, *Dynamics and equilibration of Rydberg excitations in dissipative atomic ensembles*, J. Phys. B **46**, 141001 (2013)
37. D. Petrosyan, M. Höning and M. Fleischhauer, *Spatial correlations of Rydberg excitations in optically driven atomic ensembles*, Phys. Rev. A **87**, 053414 (2013)
38. D. Petrosyan and K. Mølmer, *Stimulated adiabatic passage in a dissipative ensemble of atoms with strong Rydberg-state interactions*, Phys. Rev. A **87**, 033416 (2013)
39. M. Höning, D. Muth, D. Petrosyan and M. Fleischhauer, *Steady-state crystallization of Rydberg excitations in an optically driven lattice gas*, Phys. Rev. A **87**, 023401 (2013)
40. G. Bensky, D. Petrosyan, J. Majer, J. Schmiedmayer and G. Kurizki, *Optimizing inhomogeneous spin ensembles for quantum memory*, Phys. Rev. A **86**, 012310 (2012)
41. D. Petrosyan and M. Fleischhauer, *Electromagnetically induced transparency and photon-photon interactions with Rydberg atoms*, J. Phys. Conf. Ser. **350**, 012001 (2012)
42. D. Muth, D. Petrosyan and M. Fleischhauer, *Dynamics and evaporation of defects in Mott-insulating clusters of boson pairs*, Phys. Rev. A **85**, 013615 (2012)
43. D. Petrosyan, J. Otterbach and M. Fleischhauer, *Electromagnetically induced transparency with Rydberg atoms*, Phys. Rev. Lett. **107**, 213601 (2011)
44. G. Bensky, R. Amsüss, J. Majer, D. Petrosyan, J. Schmiedmayer and G. Kurizki, *Controlling quantum information processing in hybrid systems on chips*, Quantum Inf. Process. **10**, 1037 (2011)
45. E. Shahmoon, G. Kurizki, M. Fleischhauer and D. Petrosyan, *Strongly interacting photons in hollow-core waveguides*, Phys. Rev. A **83**, 033806 (2011)
46. G.M. Nikolopoulos and D. Petrosyan, *Atom number filter in an optical lattice* J. Phys. B **43**, 131001 (2010)
47. M. Valiente, D. Petrosyan and A. Saenz, *Comment on “Coherent shift of localized bound pairs in the Bose-Hubbard model”*, Phys. Rev. A **81**, 066101 (2010)
48. D. Petrosyan, G.M. Nikolopoulos and P. Lambropoulos, *State transfer in static and dynamic spin chains with disorder*, Phys. Rev. A **81**, 042307 (2010)
49. M. Valiente, D. Petrosyan and A. Saenz, *Three-body bound states in a lattice*, Phys. Rev. A **81**, 011601(R) (2010)

50. B. Schmidt, M. Bortz, S. Eggert, M. Fleischhauer and D. Petrosyan, *Attractively bound pairs of atoms in the Bose-Hubbard model and antiferromagnetism*, Phys. Rev. A **79**, 063634 (2009)
51. M. Valiente and D. Petrosyan, *Scattering resonances and two-particle bound states of the extended Hubbard model*, J. Phys. B **42**, 121001 (2009); Selected for J. Phys. B's 2009 Highlights
52. D. Petrosyan, G. Bensky, G. Kurizki, I. Mazets, J. Majer and J. Schmiedmayer, *Reversible state transfer between superconducting qubits and atomic ensembles*, Phys. Rev. A **79**, 040304(R) (2009); Selected for Research Highlights, Nature Physics **5**, 376 (2009)
53. M. Valiente and D. Petrosyan, *Two-particle states in the Hubbard model*, J. Phys. B **41**, 161002 (2008); Selected for J. Phys. B's 2008 Highlights
54. M. Valiente and D. Petrosyan, *Quantum dynamics of one and two bosonic atoms in a combined tight-binding periodic and weak parabolic potential*, Europhys. Lett. **83**, 30007 (2008)
55. D. Petrosyan and M. Fleischhauer, *Quantum information processing with single photons and atomic ensembles in microwave coplanar waveguide resonators*, Phys. Rev. Lett. **100**, 170501 (2008)
56. D. Petrosyan, *Tunable photonic band gaps with coherently driven atoms in optical lattices*, Phys. Rev. A **76**, 053823 (2007)
57. D. Petrosyan, B. Schmidt, J.R. Anglin and M. Fleischhauer, *Quantum liquid of repulsively bound pairs of particles in a lattice*, Phys. Rev. A **76**, 033606 (2007)
58. G. Katsoprinakis, D. Petrosyan and I.K. Kominis, *High frequency atomic magnetometer by use of electromagnetically induced transparency*, Phys. Rev. Lett. **97**, 230801 (2006)
59. D. Petrosyan and P. Lambropoulos, *Coherent population transfer in a chain of tunnel coupled quantum dots*, Opt. Commun. **264**, 419 (2006)
60. D. Petrosyan and G. Kurizki, *Quantum computer with dipole-dipole interacting two-level systems*, Quantum Information & Computation **6**, 1 (2006)
61. I. Friedler, D. Petrosyan, M. Fleischhauer and G. Kurizki, *Long-range interactions and entanglement of slow single-photon pulses*, Phys. Rev. A **72**, 043803 (2005)
62. D. Petrosyan, *Towards deterministic optical quantum computation with coherently driven atomic ensembles*, J. Opt. B **7**, S141 (2005)
63. I. Friedler, G. Kurizki and D. Petrosyan, *Deterministic quantum logic with photons via optically induced photonic band gaps*, Phys. Rev. A **71**, 023803 (2005)
64. I. Friedler, G. Kurizki and D. Petrosyan, *Giant nonlinearity and entanglement of single photons in photonic bandgap structures*, Europhys. Lett. **68**, 625 (2004)
65. D. Petrosyan and Yu.P. Malakyan, *Magneto-optical rotation and cross-phase modulation via coherently driven four-level atoms in a tripod configuration*, Phys. Rev. A **70**, 023822 (2004)
66. G.M. Nikolopoulos, D. Petrosyan and P. Lambropoulos, *Electron wavepacket propagation in a chain of coupled quantum dots*, J. Phys.: Condens. Matter **16**, 4991 (2004)
67. G.M. Nikolopoulos, D. Petrosyan and P. Lambropoulos, *Coherent electron wavepacket propagation and entanglement in array of coupled quantum dots*, Europhys. Lett. **65**, 297 (2004)

68. D. Petrosyan, G. Kurizki and M. Shapiro, *Entanglement transfer from dissociated molecules to photons*, Phys. Rev. A **67**, 012318 (2003)
69. G. Kurizki and D. Petrosyan, *Towards high-fidelity two-photon quantum communications*, Fortschr. Phys. **51**, 402 (2003) [Proceedings of Conference “Quantum Interferometry IV” (Trieste, 2002)]
70. D. Petrosyan and G. Kurizki, *Scalable solid-state quantum processor using subradiant two-atom states*, Phys. Rev. Lett. **89**, 207902 (2002)
71. G. Kurizki, D. Petrosyan, T. Opatrny, M. Blaauboer, and B. Malomed, *Self-induced transparency and giant nonlinearity in doped photonic crystals*, J. Opt. Soc. Am. B **19**, 2066 (2002)
72. G. Kurizki, A.G. Kofman, D. Petrosyan and T. Opatrny, *Control of molecular decoherence and entanglement*, J. Opt. B **4**, S294 (2002)
73. D. Petrosyan and G. Kurizki, *Symmetric photon-photon coupling by atoms with Zeeman-split sublevels*, Phys. Rev. A **65**, 033833 (2002)
74. D. Petrosyan and G. Kurizki, *Photon-photon correlations and entanglement in doped photonic crystals*, Phys. Rev. A **64**, 023810 (2001)
75. D. Petrosyan and P. Lambropoulos, *Coherent control of autoionization in optically dense media*, J. Phys. B **34**, 1711 (2001)
76. D. Petrosyan and P. Lambropoulos, *Phase control of resonantly enhanced photoionization in optically dense medium*, Phys. Rev. A **63**, 043417 (2001)
77. D. Petrosyan and P. Lambropoulos, *Phase control of photoabsorption in optically dense media*, Phys. Rev. Lett. **85**, 1843 (2000)
78. D. Petrosyan and Yu.P. Malakyan, *Electromagnetically induced transparency in a thin vapor film*, Phys. Rev. A **61**, 053820 (2000)
79. D. Petrosyan and P. Lambropoulos, *Theory of a two-mode micromaser simultaneously pumped by one- and two-photon atomic transitions*, J. Phys. B **32**, 4405 (1999)
80. D. Petrosyan and P. Lambropoulos, *Competition between one- and two-photon lasing in two cavity modes*, Phys. Rev. A **60**, 398 (1999)
81. Yu.P. Malakyan and D.M. Petrosyan, *Quantum-nondemolition measurement of the number of photons in a microcavity*, Pis'ma Zh. Eksp. Teor. Fiz. **66**, 58 (1997), [JETP Lett. **66**, 62 (1997)]
82. Yu.P. Malakyan and D.M. Petrosyan, *A self-consistent theory for lasing without population inversion in a medium of three-level V atoms*, J. Moscow Phys. Soc. **7**, 313 (1997)

Textbook (1)

83. P. Lambropoulos and D. Petrosyan, *Fundamentals of Quantum Optics and Quantum Information* (Springer, 2007)

Contributions to Books (3)

84. D. Petrosyan and M. Valiente, *Exotic few-body bound states in a lattice*, in *Modern Optics and Photonics, Atoms and Structured Media*, edited by G. Yu. Kryuchkyan, G. G. Gurzadyan and A. V. Papoyan (World Scientific, 2010) pp. 222-236

85. D. Petrosyan, *Deterministic entanglement of single photons via coherently driven atoms*, in *Decoherence, Entanglement and Information Protection in Complex Quantum Systems*, edited by V. M. Akulin, A. Sarfati, G. Kurizki and S. Pellegrin (Springer, 2005) pp. 77-90
86. G. Kurizki, A.G. Kofman and D. Petrosyan, *Photonic crystals: Atomic physics*, in *Encyclopedia of Modern Optics*, edited by B. D. Guenther, D. G. Steel, L. Bayvel (Academic Press/Elsevier, 2004) pp. 113-119

Editorial (2)

87. G. Messin, B. C. Sanders, D. Petrosyan and J. Rarity, *Special issue on Few photon optics*, J. Phys. B **42**, 110201 (2009)
88. D. Petrosyan, L.I. Childress, G.Yu. Kryuchkyan, A.I. Lvovsky, Yu.P. Malakyan and Ph. Walther, *Multiatom and Multiphoton Entanglement*, in *Decoherence, Entanglement and Information Protection in Complex Quantum Systems*, edited by V. M. Akulin, A. Sarfati, G. Kurizki and S. Pellegrin (Springer, 2005) pp. 35-39

Popular articles (1)

89. D. Petrosyan, *Quantum gates and simulations with strongly interacting Rydberg atoms*, ERCIM News **112**, 31 (2018)