

# Alexey Gorshkov

## List of Publications by Year in descending order

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Version: 2024-02-01

160  
papers

11,508  
citations

28190

55  
h-index

28224

105  
g-index

163  
all docs

163  
docs citations

163  
times ranked

6613  
citing authors

#	ARTICLE	IF	CITATIONS
1	Observation of a many-body dynamical phase transition with a 53-qubit quantum simulator. Nature, 2017, 551, 601-604.	13.7	735
2	Quantum nonlinear optics with single photons enabled by strongly interacting atoms. Nature, 2012, 488, 57-60.	13.7	679
3	Non-local propagation of correlations in quantum systems with long-range interactions. Nature, 2014, 511, 198-201.	13.7	581
4	Two-orbital $SU(N)$ magnetism with ultracold alkaline-earth atoms. Nature Physics, 2010, 6, 289-295.	6.5	572
5	Quantum many-body models with cold atoms coupled to photonic crystals. Nature Photonics, 2015, 9, 326-331.	15.6	391
6	Attractive photons in a quantum nonlinear medium. Nature, 2013, 502, 71-75.	13.7	331
7	Universal Approach to Optimal Photon Storage in Atomic Media. Physical Review Letters, 2007, 98, 123601.	2.9	306
8	Photon-Photon Interactions via Rydberg Blockade. Physical Review Letters, 2011, 107, 133602.	2.9	305
9	Tunable Superfluidity and Quantum Magnetism with Ultracold Polar Molecules. Physical Review Letters, 2011, 107, 115301.	2.9	257
10	Cavity QED with atomic mirrors. New Journal of Physics, 2012, 14, 063003.	1.2	205
11	Robust Quantum State Transfer in Random Unpolarized Spin Chains. Physical Review Letters, 2011, 106, 040505.	2.9	194
12	Photon storage in $\hat{\rho}$ -type optically dense atomic media. II. Free-space model. Physical Review A, 2007, 76, .	1.0	193
13	Scalable architecture for a room temperature solid-state quantum information processor. Nature Communications, 2012, 3, 800.	5.8	190
14	Optimal Control of Light Pulse Storage and Retrieval. Physical Review Letters, 2007, 98, 243602.	2.9	189
15	Photon storage in $\hat{\rho}$ -type optically dense atomic media. I. Cavity model. Physical Review A, 2007, 76, .	1.0	180
16	Realizing Fractional Chern Insulators in Dipolar Spin Systems. Physical Review Letters, 2013, 110, 185302.	2.9	167
17	Kitaev Chains with Long-Range Pairing. Physical Review Letters, 2014, 113, 156402.	2.9	164
18	A Quantum Many-Body Spin System in an Optical Lattice Clock. Science, 2013, 341, 632-636.	6.0	152

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19	Nearly Linear Light Cones in Long-Range Interacting Quantum Systems. <i>Physical Review Letters</i> , 2015, 114, 157201.	2.9	143
20	Far-field optical imaging and manipulation of individual spins with nanoscale resolution. <i>Nature Physics</i> , 2010, 6, 912-918.	6.5	142
21	Quantum magnetism with polar alkali-metal dimers. <i>Physical Review A</i> , 2011, 84, .	1.0	142
22	Quantum Computer Systems for Scientific Discovery. <i>PRX Quantum</i> , 2021, 2, .	3.5	142
23	Distributed Quantum Metrology with Linear Networks and Separable Inputs. <i>Physical Review Letters</i> , 2018, 121, 043604.	2.9	136
24	Coherent Quantum Optical Control with Subwavelength Resolution. <i>Physical Review Letters</i> , 2008, 100, 093005.	2.9	135
25	Alkaline-Earth-Metal Atoms as Few-Qubit Quantum Registers. <i>Physical Review Letters</i> , 2009, 102, 110503.	2.9	135
26	Quantum approximate optimization of the long-range Ising model with a trapped-ion quantum simulator. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2020, 117, 25396-25401.	3.3	122
27	Observation of prethermalization in long-range interacting spin chains. <i>Science Advances</i> , 2017, 3, e1700672.	4.7	114
28	Nonequilibrium many-body steady states via Keldysh formalism. <i>Physical Review B</i> , 2016, 93, .	1.1	111
29	Optimal light storage in atomic vapor. <i>Physical Review A</i> , 2008, 78, .	1.0	104
30	Observation of three-photon bound states in a quantum nonlinear medium. <i>Science</i> , 2018, 359, 783-786.	6.0	99
31	Anyonic interferometry and protected memories in atomic spin lattices. <i>Nature Physics</i> , 2008, 4, 482-488.	6.5	97
32	Topological Flat Bands from Dipolar Spin Systems. <i>Physical Review Letters</i> , 2012, 109, 266804.	2.9	96
33	Optimal and secure measurement protocols for quantum sensor networks. <i>Physical Review A</i> , 2018, 97, .	1.0	95
34	Hilbert-Space Fragmentation from Strict Confinement. <i>Physical Review Letters</i> , 2020, 124, 207602.	2.9	95
35	Topological phases in ultracold polar-molecule quantum magnets. <i>Physical Review B</i> , 2013, 87, .	1.1	94
36	Persistence of Locality in Systems with Power-Law Interactions. <i>Physical Review Letters</i> , 2014, 113, 030602.	2.9	94

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37	Emergent equilibrium in many-body optical bistability. <i>Physical Review A</i> , 2017, 95, .	1.0	91
38	Confined Quasiparticle Dynamics in Long-Range Interacting Quantum Spin Chains. <i>Physical Review Letters</i> , 2019, 122, 150601.	2.9	90
39	Measurement-induced quantum phases realized in a trapped-ion quantum computer. <i>Nature Physics</i> , 2022, 18, 760-764.	6.5	87
40	Suppression of Inelastic Collisions Between Polar Molecules With a Repulsive Shield. <i>Physical Review Letters</i> , 2008, 101, 073201.	2.9	84
41	Anomalous Broadening in Driven Dissipative Rydberg Systems. <i>Physical Review Letters</i> , 2016, 116, 113001.	2.9	84
42	Dissipative Many-Body Quantum Optics in Rydberg Media. <i>Physical Review Letters</i> , 2013, 110, 153601.	2.9	82
43	Optimal light storage with full pulse-shape control. <i>Physical Review A</i> , 2008, 78, .	1.0	81
44	Scattering resonances and bound states for strongly interacting Rydberg polaritons. <i>Physical Review A</i> , 2014, 90, .	1.0	78
45	Observation of Stark many-body localization without disorder. <i>Nature</i> , 2021, 599, 393-398.	13.7	69
46	Continuous Symmetry Breaking in 1D Long-Range Interacting Quantum Systems. <i>Physical Review Letters</i> , 2017, 119, 023001.	2.9	68
47	Photon storage in $\hat{b}$ -type optically dense atomic media. III. Effects of inhomogeneous broadening. <i>Physical Review A</i> , 2007, 76, .	1.0	67
48	Topologically protected quantum state transfer in a chiral spin liquid. <i>Nature Communications</i> , 2013, 4, 1585.	5.8	67
49	Optimization of photon storage fidelity in ordered atomic arrays. <i>New Journal of Physics</i> , 2018, 20, 083048.	1.2	64
50	Photon storage in $\hat{b}$ -type optically dense atomic media. IV. Optimal control using gradient ascent. <i>Physical Review A</i> , 2008, 77, .	1.0	62
51	Locality and Digital Quantum Simulation of Power-Law Interactions. <i>Physical Review X</i> , 2019, 9, .	2.8	62
52	Dark State Optical Lattice with a Subwavelength Spatial Structure. <i>Physical Review Letters</i> , 2018, 120, 083601.	2.9	60
53	Light storage in an optically thick atomic ensemble under conditions of electromagnetically induced transparency and four-wave mixing. <i>Physical Review A</i> , 2011, 83, .	1.0	59
54	Interacting Qubit-Photon Bound States with Superconducting Circuits. <i>Physical Review X</i> , 2019, 9, .	2.8	59

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55	Quench Dynamics of a Fermi Gas with Strong Nonlocal Interactions. <i>Physical Review X</i> , 2021, 11, .	2.8	59
56	Topological phases with long-range interactions. <i>Physical Review B</i> , 2016, 93, .	1.1	58
57	Kaleidoscope of quantum phases in a long-range interacting spin-1 chain. <i>Physical Review B</i> , 2016, 93, .	1.1	57
58	Hierarchy of Linear Light Cones with Long-Range Interactions. <i>Physical Review X</i> , 2020, 10, .	2.8	56
59	Domain-wall confinement and dynamics in a quantum simulator. <i>Nature Physics</i> , 2021, 17, 742-747.	6.5	56
60	Kitaev honeycomb and other exotic spin models with polar molecules. <i>Molecular Physics</i> , 2013, 111, 1908-1916.	0.8	55
61	Coulomb Bound States of Strongly Interacting Photons. <i>Physical Review Letters</i> , 2015, 115, 123601.	2.9	55
62	Probing many-body interactions in an optical lattice clock. <i>Annals of Physics</i> , 2014, 340, 311-351.	1.0	52
63	Causality and quantum criticality in long-range lattice models. <i>Physical Review B</i> , 2016, 93, .	1.1	52
64	Quantum simulation of hyperbolic space with circuit quantum electrodynamics: From graphs to geometry. <i>Physical Review A</i> , 2020, 102, .	1.0	51
65	Optimal Protocols in Quantum Annealing and Quantum Approximate Optimization Algorithm Problems. <i>Physical Review Letters</i> , 2021, 126, 070505.	2.9	51
66	Entanglement Area Laws for Long-Range Interacting Systems. <i>Physical Review Letters</i> , 2017, 119, 050501.	2.9	49
67	Multicritical behavior in dissipative Ising models. <i>Physical Review A</i> , 2017, 95, .	1.0	47
68	Fast Quantum State Transfer and Entanglement Renormalization Using Long-Range Interactions. <i>Physical Review Letters</i> , 2017, 119, 170503.	2.9	47
69	Collective phases of strongly interacting cavity photons. <i>Physical Review A</i> , 2016, 94, .	1.0	45
70	Many-Body Treatment of the Collisional Frequency Shift in Fermionic Atoms. <i>Physical Review Letters</i> , 2009, 103, 260402.	2.9	43
71	Structure of He-10 Low-Lying States Uncovered by Correlations. <i>Physical Review Letters</i> , 2012, 108, 202502.	2.9	43
72	Fractional quantum Hall states of Rydberg polaritons. <i>Physical Review A</i> , 2015, 91, .	1.0	42

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73	Minimal Model for Fast Scrambling. <i>Physical Review Letters</i> , 2020, 125, 130601.	2.9	42
74	Crystallography of hyperbolic lattices. <i>Physical Review B</i> , 2022, 105, .	1.1	40
75	Heisenberg-scaling measurement protocol for analytic functions with quantum sensor networks. <i>Physical Review A</i> , 2019, 100, .	1.0	39
76	Solvable Family of Driven-Dissipative Many-Body Systems. <i>Physical Review Letters</i> , 2017, 119, 190402.	2.9	38
77	Photonic Phase Gate via an Exchange of Fermionic Spin Waves in a Spin Chain. <i>Physical Review Letters</i> , 2010, 105, 060502.	2.9	36
78	Out-of-time-order correlators in finite open systems. <i>Physical Review B</i> , 2018, 97, .	1.1	36
79	Lieb-Robinson Light Cone for Power-Law Interactions. <i>Physical Review Letters</i> , 2021, 127, 160401.	2.9	36
80	Quantum logic between remote quantum registers. <i>Physical Review A</i> , 2013, 87, .	1.0	35
81	Subwavelength-width optical tunnel junctions for ultracold atoms. <i>Physical Review A</i> , 2016, 94, .	1.0	35
82	Effective Field Theory for Rydberg Polaritons. <i>Physical Review Letters</i> , 2016, 117, 113601.	2.9	35
83	Symmetry Breaking and Error Correction in Open Quantum Systems. <i>Physical Review Letters</i> , 2020, 125, 240405.	2.9	34
84	Circuit complexity across a topological phase transition. <i>Physical Review Research</i> , 2020, 2, .	1.3	34
85	Real-time dynamics of string breaking in quantum spin chains. <i>Physical Review B</i> , 2020, 102, .	1.1	33
86	On-demand indistinguishable single photons from an efficient and pure source based on a Rydberg ensemble. <i>Optica</i> , 2020, 7, 813.	4.8	33
87	Probing Ground-State Phase Transitions through Quench Dynamics. <i>Physical Review Letters</i> , 2019, 123, 115701.	2.9	32
88	Nonequilibrium Fixed Points of Coupled Ising Models. <i>Physical Review X</i> , 2020, 10, .	2.8	32
89	Rainbow scars: From area to volume law. <i>Physical Review B</i> , 2022, 105, .	1.1	32
90	Dissipation-induced dipole blockade and antiblockade in driven Rydberg systems. <i>Physical Review A</i> , 2018, 97, .	1.0	29

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91	Dynamical Phase Transitions in Sampling Complexity. Physical Review Letters, 2018, 121, 030501.	2.9	29
92	Correlated Photon Dynamics in Dissipative Rydberg Media. Physical Review Letters, 2017, 119, 043602.	2.9	28
93	Unifying Quantum and Classical Speed Limits on Observables. Physical Review X, 2022, 12, .	2.8	28
94	Signaling and scrambling with strongly long-range interactions. Physical Review A, 2020, 102, .	1.0	27
95	Spontaneous avalanche dephasing in large Rydberg ensembles. Physical Review A, 2017, 96, .	1.0	26
96	Interference of Temporally Distinguishable Photons Using Frequency-Resolved Detection. Physical Review Letters, 2019, 123, 123603.	2.9	26
97	Asymmetric Blockade and Multiqubit Gates via Dipole-Dipole Interactions. Physical Review Letters, 2021, 127, 120501.	2.9	26
98	Circuit Quantum Electrodynamics in Hyperbolic Space: From Photon Bound States to Frustrated Spin Models. Physical Review Letters, 2022, 128, 013601.	2.9	26
99	Efimov States of Strongly Interacting Photons. Physical Review Letters, 2017, 119, 233601.	2.9	24
100	$d$ -wave superfluidity in optical lattices of ultracold polar molecules. Physical Review A, 2011, 84, .	1.0	23
101	Fluctuation-Induced Torque on a Topological Insulator out of Thermal Equilibrium. Physical Review Letters, 2019, 123, 055901.	2.9	23
102	Slow light propagation and amplification via electromagnetically induced transparency and four-wave mixing in an optically dense atomic vapor. Journal of Modern Optics, 2009, 56, 1916-1925.	0.6	22
103	Realization of coherent optically dense media via buffer-gas cooling. Physical Review A, 2009, 79, .	1.0	20
104	Locality and heating in periodically driven, power-law-interacting systems. Physical Review A, 2019, 100, .	1.0	20
105	Destructive Error Interference in Product-Formula Lattice Simulation. Physical Review Letters, 2020, 124, 220502.	2.9	20
106	Resolved Atomic Interaction Sidebands in an Optical Clock Transition. Physical Review Letters, 2011, 106, 250801.	2.9	19
107	Realizing exactly solvable SU(N) magnets with thermal atoms. Physical Review A, 2016, 93, .	1.0	19
108	Photon propagation through dissipative Rydberg media at large input rates. Physical Review Research, 2020, 2, .	1.3	19

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109	Asymmetric Particle Transport and Light-Cone Dynamics Induced by Anyonic Statistics. <i>Physical Review Letters</i> , 2018, 121, 250404.	2.9	18
110	Optimal State Transfer and Entanglement Generation in Power-Law Interacting Systems. <i>Physical Review X</i> , 2021, 11, .	2.8	18
111	Nondestructive Cooling of an Atomic Quantum Register via State-Insensitive Rydberg Interactions. <i>Physical Review Letters</i> , 2019, 123, 213603.	2.9	17
112	Fast entanglement distribution with atomic ensembles and fluorescent detection. <i>Physical Review A</i> , 2010, 81, .	1.0	16
113	Many-body decoherence dynamics and optimized operation of a single-photon switch. <i>New Journal of Physics</i> , 2016, 18, 092001.	1.2	16
114	Parafermionic Zero Modes in Ultracold Bosonic Systems. <i>Physical Review Letters</i> , 2015, 115, 065301.	2.9	15
115	Photon Subtraction by Many-Body Decoherence. <i>Physical Review Letters</i> , 2018, 120, 113601.	2.9	14
116	Spectroscopy of dipolar fermions in layered two-dimensional and three-dimensional lattices. <i>Physical Review A</i> , 2011, 84, .	1.0	12
117	Self-organization of atoms coupled to a chiral reservoir. <i>Physical Review A</i> , 2016, 94, .	1.0	12
118	Fractional Quantum Hall Phases of Bosons with Tunable Interactions: From the Laughlin Liquid to a Fractional Wigner Crystal. <i>Physical Review Letters</i> , 2018, 121, 253403.	2.9	10
119	Optimal measurement of field properties with quantum sensor networks. <i>Physical Review A</i> , 2021, 103, .	1.0	10
120	Critical theory for the breakdown of photon blockade. <i>Physical Review Research</i> , 2021, 3, .	1.3	10
121	Localization and Criticality in Antiblockaded Two-Dimensional Rydberg Atom Arrays. <i>Physical Review Letters</i> , 2022, 128, 013603.	2.9	10
122	Controllable quantum spin glasses with magnetic impurities embedded in quantum solids. <i>Physical Review B</i> , 2013, 88, .	1.1	9
123	Bilayer fractional quantum Hall states with dipoles. <i>Physical Review A</i> , 2015, 92, .	1.0	9
124	Interaction-induced transition in the quantum chaotic dynamics of a disordered metal. <i>Annals of Physics</i> , 2019, 405, 1-13.	1.0	8
125	Exact sampling hardness of Ising spin models. <i>Physical Review A</i> , 2017, 96, .	1.0	7
126	Unitary entanglement construction in hierarchical networks. <i>Physical Review A</i> , 2018, 98, .	1.0	7



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127	Floquet engineering of optical lattices with spatial features and periodicity below the diffraction limit. <i>New Journal of Physics</i> , 2019, 21, 113058.	1.2	7
128	Feedback-stabilized dynamical steady states in the Bose-Hubbard model. <i>Physical Review Research</i> , 2021, 3, .	1.3	7
129	Optimizing slow and stored light for multidisciplinary applications. , 2008, , .		6
130	Lieb-Robinson bounds on $n$ -partite connected correlation functions. <i>Physical Review A</i> , 2017, 96, .	1.0	6
131	Coherent optical nanotweezers for ultracold atoms. <i>Physical Review A</i> , 2020, 102, .	1.0	6
132	Quantum routing with fast reversals. <i>Quantum - the Open Journal for Quantum Science</i> , 0, 5, 533.	0.0	6
133	Kramers' degeneracy for open systems in thermal equilibrium. <i>Physical Review B</i> , 2022, 105, .	1.1	6
134	Beyond the Spin Model Approximation for Ramsey Spectroscopy. <i>Physical Review Letters</i> , 2014, 112, 123001.	2.9	5
135	Exactly soluble model of boundary degeneracy. <i>Physical Review B</i> , 2017, 95, .	1.1	5
136	Spectrum Estimation of Density Operators with Alkaline-Earth Atoms. <i>Physical Review Letters</i> , 2018, 120, 025301.	2.9	5
137	Complexity of Fermionic Dissipative Interactions and Applications to Quantum Computing. <i>PRX Quantum</i> , 2021, 2, .	3.5	5
138	Nature of the nonequilibrium phase transition in the non-Markovian driven Dicke model. <i>Physical Review A</i> , 2020, 102, .	1.0	5
139	Optical quantum memory for noble-gas spins based on spin-exchange collisions. <i>Physical Review A</i> , 2022, 105, .	1.0	5
140	Signatures of Incoherence in a Quantum Information Processor. <i>Quantum Information Processing</i> , 2007, 6, 431-444.	1.0	4
141	Exotic Photonic Molecules via Lennard-Jones-like Potentials. <i>Physical Review Letters</i> , 2020, 125, 093601.	2.9	4
142	Tunable Three-Body Loss in a Nonlinear Rydberg Medium. <i>Physical Review Letters</i> , 2021, 126, 173401.	2.9	4
143	Protocols for estimating multiple functions with quantum sensor networks: Geometry and performance. <i>Physical Review Research</i> , 2021, 3, .	1.3	4
144	Frustration-induced anomalous transport and strong photon decay in waveguide QED. <i>Physical Review Research</i> , 2021, 3, .	1.3	4

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145	Entanglement bounds on the performance of quantum computing architectures. Physical Review Research, 2020, 2, .	1.3	4
146	Nearly optimal time-independent reversal of a spin chain. Physical Review Research, 2022, 4, .	1.3	4
147	The high-symmetry switch. Nature Physics, 2014, 10, 708-709.	6.5	3
148	Optimization of slow and stored light in atomic vapor. , 2007, 6482, 121.		2
149	Out-of-time-order correlators in finite open systems. Physical Review B, 2018, 97, .	1.1	2
150	Scale-Invariant Continuous Entanglement Renormalization of a Chern Insulator. Physical Review Letters, 2019, 122, 120502.	2.9	1
151	Singularities in nearly uniform one-dimensional condensates due to quantum diffusion. Physical Review A, 2021, 104, .	1.0	1
152	Resonant enhancement of three-body loss between strongly interacting photons. Physical Review Research, 2022, 4, .	1.3	1
153	Multi-photon entanglement: from quantum curiosity to quantum computing and quantum repeaters. , 2007, , .		0
154	Publisher's Note: Scattering resonances and bound states for strongly interacting Rydberg polaritons [Phys. Rev. A<b>90</b>, 053804 (2014)]. Physical Review A, 2015, 91, .	1.0	0
155	Optimizing Slow and Stored Light via EIT in Alkali Vapor. , 2007, , .		0
156	Slow and stored light manipulations at high atomic densities. , 2009, , .		0
157	Four-Wave Mixing in a Stored Light Regime. , 2009, , .		0
158	Rydberg Ensemble for Quantum Networking. , 2020, , .		0
159	Heisenberg-scaling measurement protocol for analytic functions with quantum sensor networks. Physical Review A, 2019, 100, .	1.0	0
160	Universal scattering with general dispersion relations. Physical Review Research, 2022, 4, .	1.3	0