

Ian P Mcculloch

List of Publications by Year in descending order

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109
papers

6,173
citations

71102

41
h-index

69250

77
g-index

110
all docs

110
docs citations

110
times ranked

3775
citing authors

#	ARTICLE	IF	CITATIONS
1	Probing the relaxation towards equilibrium in an isolated strongly correlated one-dimensional Bose gas. <i>Nature Physics</i> , 2012, 8, 325-330.	16.7	762
2	The ALPS project release 1.3: Open-source software for strongly correlated systems. <i>Journal of Magnetism and Magnetic Materials</i> , 2007, 310, 1187-1193.	2.3	623
3	Nature of the Spin-Liquid Ground State of the $S=1$ Kagome Lattice. <i>Physical Review Letters</i> , 2012, 109, 067201.	7.8	487
4	From density-matrix renormalization group to matrix product states. <i>Journal of Statistical Mechanics: Theory and Experiment</i> , 2007, 2007, P10014-P10014.	2.3	310
5	Expansion Dynamics of Interacting Bosons in Homogeneous Lattices in One and Two Dimensions. <i>Physical Review Letters</i> , 2013, 110, 205301.	7.8	236
6	The non-Abelian density matrix renormalization group algorithm. <i>Europhysics Letters</i> , 2002, 57, 852-858.	2.0	196
7	Quasiperiodic Bose-Hubbard model and localization in one-dimensional cold atomic gases. <i>Physical Review A</i> , 2008, 78, .	2.5	164
8	Statistically induced phase transitions and anyons in 1D optical lattices. <i>Nature Communications</i> , 2011, 2, 361.	12.8	143
9	Vortex and Meissner phases of strongly interacting bosons on a two-leg ladder. <i>Physical Review B</i> , 2015, 91, .	3.2	117
10	Exploring Local Quantum Many-Body Relaxation by Atoms in Optical Superlattices. <i>Physical Review Letters</i> , 2008, 101, 063001.	7.8	114
11	Real-time study of diffusive and ballistic transport in spin-1 chains using the adaptive time-dependent density matrix renormalization group method. <i>Physical Review B</i> , 2009, 79, .	3.2	104
12	The ALPS Project: Open Source Software for Strongly Correlated Systems. <i>Journal of the Physical Society of Japan</i> , 2005, 74, 30-35.	1.6	103
13	Strictly single-site DMRG algorithm with subspace expansion. <i>Physical Review B</i> , 2015, 91, .	3.2	98
14	Chebyshev matrix product state approach for spectral functions. <i>Physical Review B</i> , 2011, 83, .	3.2	96
15	Observation of a Disordered Bosonic Insulator from Weak to Strong Interactions. <i>Physical Review Letters</i> , 2014, 113, 095301.	7.8	93
16	Solving nonequilibrium dynamical mean-field theory using matrix product states. <i>Physical Review B</i> , 2014, 90, .	3.2	91
17	Probing local relaxation of cold atoms in optical superlattices. <i>Physical Review A</i> , 2008, 78, .	2.5	88
18	Spontaneous Increase of Magnetic Flux and Chiral-Current Reversal in Bosonic Ladders: Swimming against the Tide. <i>Physical Review Letters</i> , 2015, 115, 190402.	7.8	76

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19	Spin-charge separation in two-component Bose gases. Physical Review A, 2008, 77, .	2.5	75
20	Prethermalization and persistent order in the absence of a thermal phase transition. Physical Review B, 2017, 95, .	3.2	75
21	Generic construction of efficient matrix product operators. Physical Review B, 2017, 95, .	3.2	73
22	Phase diagram of an anisotropic frustrated ferromagnetic spin- $\frac{1}{2}$ chain in a magnetic field: A density matrix renormalization group study. Physical Review B, 2009, 80, .	3.2	69
23	Chebyshev matrix product state impurity solver for dynamical mean-field theory. Physical Review B, 2014, 90, .	3.2	65
24	Symmetry-broken states in a system of interacting bosons on a two-leg ladder with a uniform Abelian gauge field. Physical Review A, 2016, 94, .	2.5	65
25	Modulation spectroscopy with ultracold fermions in an optical lattice. Physical Review A, 2006, 74, .	2.5	63
26	Infinite boundary conditions for matrix product state calculations. Physical Review B, 2012, 86, .	3.2	63
27	Kondo screening cloud in the single-impurity Anderson model: A density matrix renormalization group study. Physical Review B, 2009, 80, .	3.2	58
28	Sudden expansion of Mott insulators in one dimension. Physical Review B, 2013, 88, .	3.2	58
29	Phase diagram of the J_1 - J_2 spin-1 chain on the Kagome lattice. Physical Review B, 2015, 91, .	3.2	58
30	Localized spin ordering in Kondo lattice models. Physical Review B, 2002, 65, .	3.2	55
31	Geometry and the hidden order of Luttinger liquids: The universality of squeezed space. Physical Review B, 2004, 70, .	3.2	55
32	Long-Time Behavior of the Momentum Distribution During the Sudden Expansion of a Spin-Imbalanced Fermi Gas in One Dimension. Physical Review Letters, 2012, 109, 110602.	7.8	53
33	Conformal data from finite entanglement scaling. Physical Review B, 2015, 91, .	3.2	52
34	Vector chiral order in frustrated spin chains. Physical Review B, 2008, 77, .	3.2	49
35	Real-time energy dynamics in spin- $\frac{1}{2}$ chains. Physical Review B, 2011, 84, .	3.2	46
36	Symmetry fractionalization in the topological phase of the spin- $\frac{1}{2}$ Heisenberg model. Physical Review B, 2016, 94, .	3.2	46

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37	Quantum magnetism of bosons with synthetic gauge fields in one-dimensional optical lattices: A density-matrix renormalization-group study. <i>Physical Review A</i> , 2014, 89, .	2.5	45
38	Imaginary-Time Matrix Product State Impurity Solver for Dynamical Mean-Field Theory. <i>Physical Review X</i> , 2015, 5, .	8.9	45
39	Spectral functions and time evolution from the Chebyshev recursion. <i>Physical Review B</i> , 2015, 91, .	3.2	44
40	Precursor of the Laughlin state of hard-core bosons on a two-leg ladder. <i>Physical Review B</i> , 2017, 96, .	3.2	44
41	Lanczos algorithm with matrix product states for dynamical correlation functions. <i>Physical Review B</i> , 2012, 85, .	3.2	42
42	Entanglement spectroscopy of SU(2)-broken phases in two dimensions. <i>Physical Review B</i> , 2013, 88, .	3.2	37
43	Density Matrix Renormalisation Group Method and Symmetries of the Hamiltonian. <i>Australian Journal of Physics</i> , 2000, 53, 597.	0.6	35
44	Expansion velocity of a one-dimensional, two-component Fermi gas during the sudden expansion in the ballistic regime. <i>Physical Review A</i> , 2012, 85, .	2.5	31
45	Boundary quantum critical phenomena with entanglement renormalization. <i>Physical Review B</i> , 2010, 82, .	3.2	30
46	Landau-Zener Sweeps and Sudden Quenches in Coupled Bose-Hubbard Chains. <i>Physical Review Letters</i> , 2011, 106, 155302.	7.8	30
47	Strongly interacting bosons on a three-leg ladder in the presence of a homogeneous flux. <i>New Journal of Physics</i> , 2015, 17, 092001.	2.9	30
48	Fast convergence of imaginary time evolution tensor network algorithms by recycling the environment. <i>Physical Review B</i> , 2015, 91, .	3.2	29
49	Total spin in the density matrix renormalization group algorithm. <i>Philosophical Magazine Letters</i> , 2001, 81, 447-453.	1.2	26
50	Magnetism, coherent many-particle dynamics, and relaxation with ultracold bosons in optical superlattices. <i>Physical Review A</i> , 2009, 79, .	2.5	26
51	Detection and characterization of symmetry-broken long-range orders in the spin- $\frac{1}{2}$ triangular Heisenberg model. <i>Physical Review B</i> , 2017, 96, .	3.2	26
52	Spinful bosons in an optical lattice. <i>Physical Review A</i> , 2006, 74, .	2.5	25
53	Nonthermal Melting of Néel Order in the Hubbard Model. <i>Physical Review X</i> , 2015, 5, .	8.9	25
54	Spin-one Heisenberg antiferromagnetic chain with exchange and single-ion anisotropies. <i>Physical Review B</i> , 2009, 79, .	3.2	24

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55	Topological nature of spinons and holons: Elementary excitations from matrix product states with conserved symmetries. <i>Physical Review B</i> , 2018, 97, .	3.2	24
56	Dynamical phase transitions in the two-dimensional transverse-field Ising model. <i>Physical Review Research</i> , 2022, 4, .	3.6	24
57	Excitations in two-component Bose gases. <i>New Journal of Physics</i> , 2008, 10, 045025.	2.9	23
58	Chebyshev matrix product state approach for time evolution. <i>Physical Review B</i> , 2015, 92, .	3.2	22
59	Ferromagnetism in Kondo lattice models. <i>Philosophical Magazine Letters</i> , 2001, 81, 869-875.	1.2	21
60	Creation and dynamics of remote spin-entangled pairs in the expansion of strongly correlated fermions in an optical lattice. <i>New Journal of Physics</i> , 2013, 15, 053043.	2.9	21
61	Quantum criticality in the SO(5) bilinear-biquadratic Heisenberg chain. <i>Physical Review B</i> , 2011, 83, .	3.2	20
62	Quantum Critical Spin-2 Chain with Emergent SU(3) Symmetry. <i>Physical Review Letters</i> , 2015, 114, 145301.	7.8	20
63	Phase diagram of the 1D Kondo lattice model. <i>Journal of Low Temperature Physics</i> , 1999, 117, 323-328.	1.4	19
64	Quasiparticles in the Kondo lattice model at partial fillings of the conduction band using the density matrix renormalization group. <i>Physical Review B</i> , 2009, 79, .	3.2	18
65	Valence-bond entanglement entropy of frustrated spin chains. <i>Physical Review B</i> , 2010, 82, .	3.2	17
66	Haldane Phase in the Hubbard Model at 2/3-Filling for the Organic Molecular Compound Mo ₃ S ₇ (dmit) ₃ . <i>Physical Review Letters</i> , 2014, 113, 267204.	7.8	17
67	Phase diagram of the spin-1/2 Heisenberg model on a three-leg cylinder. <i>Physical Review B</i> , 2015, 91, .	3.2	17
68	Systematic errors in Gaussian quantum Monte Carlo and a systematic study of the symmetry projection method. <i>Physical Review B</i> , 2008, 77, .	3.2	15
69	Miscible-immiscible quantum phase transition in coupled two-component Bose-Einstein condensates in one-dimensional optical lattices. <i>Physical Review A</i> , 2014, 90, .	2.5	15
70	Phase diagram of the quantum Ising model with long-range interactions on an infinite-cylinder triangular lattice. <i>Physical Review B</i> , 2018, 97, .	3.2	15
71	What is a Quantum Shock Wave?. <i>Physical Review Letters</i> , 2020, 125, 180401.	7.8	15
72	Edge singularities in high-energy spectra of gapped one-dimensional magnets in strong magnetic fields. <i>Physical Review B</i> , 2007, 75, .	3.2	14

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73	Dimerized and trimerized phases for spin-2 bosons in a one-dimensional optical lattice. Physical Review A, 2012, 85, .	2.5	14
74	Haldane insulator protected by reflection symmetry in the doped Hubbard model on the three-legged ladder. Physical Review B, 2016, 94, .	3.2	14
75	Hybrid infinite time-evolving block decimation algorithm for long-range multidimensional quantum many-body systems. Physical Review B, 2020, 102, .	3.2	14
76	Double zigzag spin chain in a strong magnetic field close to saturation. Physical Review B, 2013, 88, .	3.2	13
77	Domain-wall melting in ultracold-boson systems with hole and spin-flip defects. Physical Review A, 2014, 89, .	2.5	13
78	Geometry and topological order in the Luttinger liquid state. Europhysics Letters, 2004, 65, 512-518.	2.0	12
79	Ground-state properties of antiferromagnetic anisotropic $S=1$ Heisenberg spin chains. Physical Review B, 2012, 85, .	3.2	12
80	Deterministic Many-Resonator Entanglement of Nearly Arbitrary Microwave States via Attractive Bose-Hubbard Simulation. Physical Review X, 2013, 3, .	8.9	12
81	Robustness of gauge-invariant dynamics against defects in ultracold-atom gauge theories. Physical Review Research, 2020, 2, .	3.6	12
82	Stroboscopic observation of quantum many-body dynamics. Physical Review A, 2012, 85, .	2.5	11
83	Low-energy effective theories of the two-thirds filled Hubbard model on the triangular necklace lattice. Physical Review B, 2014, 90, .	3.2	11
84	Coherent Spin-Current Oscillations in Transverse Magnetic Fields. Physical Review Letters, 2011, 106, 160602.	7.8	10
85	Dynamical windows for real-time evolution with matrix product states. Physical Review B, 2013, 88, .	3.2	10
86	Ferromagnetic phases in the Kondo lattice model. The Philosophical Magazine: Physics of Condensed Matter B, Statistical Mechanics, Electronic, Optical and Magnetic Properties, 2002, 82, 1211-1224.	0.6	9
87	Comment on "Phase separation in a two-species Bose mixture". Physical Review A, 2014, 89, .	2.5	9
88	Entanglement entropy scaling of the XXZ chain. Journal of Statistical Mechanics: Theory and Experiment, 2013, 2013, P10007.	2.3	8
89	Optical conductivity of the Hubbard chain away from half filling. Physical Review B, 2016, 93, .	3.2	8
90	NMR Evidence for a Two-Step Phase Separation in $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$. Physical Review Letters, 2004, 93, 037002.	7.8	7

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91	Quantum Heisenberg antiferromagnetic chains with exchange and single-ion anisotropies. Journal of Physics: Conference Series, 2010, 200, 022046.	0.4	7
92	Dynamics of multiple atoms in one-dimensional fields. Physical Review A, 2019, 99, .	2.5	7
93	Coulomb interaction effects and electron spin relaxation in the one-dimensional Kondo lattice model. Physical Review B, 2011, 83, .	3.2	6
94	Fractional excitations in cold atomic gases. Physical Review A, 2012, 86, .	2.5	6
95	Field-controlled spin current in frustrated spin chains. Condensed Matter Physics, 2009, 12, 429-434.	0.7	6
96	Classical and quantum anisotropic Heisenberg antiferromagnets. Condensed Matter Physics, 2009, 12, 547-558.	0.7	6
97	Magnetism in the dilute Kondo lattice model. Physical Review B, 2004, 69, .	3.2	5
98	Topological phase transition and the effect of Hubbard interactions on the one-dimensional topological Kondo insulator. Physical Review B, 2018, 97, .	3.2	5
99	Expansion after a geometric quench of an atomic polarized attractive Fermi gas in one dimension. Journal of Physics: Conference Series, 2013, 414, 012033.	0.4	3
100	Symmetry-protected trivial phases and quantum phase transitions in an anisotropic antiferromagnetic spin-1 biquadratic model. Physical Review B, 2020, 102, .	3.2	3
101	Efficient perturbation theory to improve the density matrix renormalization group. Physical Review B, 2017, 95, .	3.2	2
102	Cumulants and scaling functions of infinite matrix product states. Physical Review B, 2019, 100, .	3.2	2
103	Symmetry between repulsive and attractive interactions in driven-dissipative Bose-Hubbard systems. Scientific Reports, 2018, 8, 3698.	3.3	1
104	Strong coupling regime in the two-dimensional Hubbard model. Journal of Magnetism and Magnetic Materials, 1998, 184, 316-318.	2.3	0
105	Comment on "Equivalence of the variational matrix product method and the density matrix renormalization group applied to spin chains" by J. Dukelsky et al.. Europhysics Letters, 2003, 61, 138-139.	2.0	0
106	Publisher's Note: Quasiparticles in the Kondo lattice model at partial fillings of the conduction band using the density matrix renormalization group [Phys. Rev. B 79, 235107 (2009)]. Physical Review B, 2009, 79, .	3.2	0
107	Publisher's Note: Precursor of the Laughlin state of hard-core bosons on a two-leg ladder [Phys. Rev. B 96, 014524 (2017)]. Physical Review B, 2018, 98, .	3.2	0
108	Publisher's Note: Low-energy effective theories of the two-thirds filled Hubbard model on the triangular necklace lattice [Phys. Rev. B 90, 035120 (2014)]. Physical Review B, 2020, 101, .	3.2	0

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109	Density matrix renormalization group algorithm and the two-dimensional t-j model. The Philosophical Magazine: Physics of Condensed Matter B, Statistical Mechanics, Electronic, Optical and Magnetic Properties, 2001, 81, 1603-1613.	0.6	0