# Simone Montangero

List of Publications by Year
in descending order

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|---|---|---|---|
| 144 papers | 6,272 citations | 70961<br>41 h-index | 79541<br>73 g-index |
| 149 all docs | 149 docs citations | 149 times ranked | 3755 citing authors |

| # | Article | IF | Citations |
|---|---------|-----|-----------|
| 1 | Generation and manipulation of SchrÃ¶dinger cat states in Rydberg atom arrays. Science, 2019, 365, 570-574. | 6.0 | 375 |
| 2 | Optimal Control at the Quantum Speed Limit. Physical Review Letters, 2009, 103, 240501. | 2.9 | 372 |
| 3 | Optimal Control Technique for Many-Body Quantum Dynamics. Physical Review Letters, 2011, 106, 190501. | 2.9 | 300 |
| 4 | Simulating lattice gauge theories within quantum technologies. European Physical Journal D, 2020, 74, 1. | 0.6 | 272 |
| 5 | Chopped random-basis quantum optimization. Physical Review A, 2011, 84, . | 1.0 | 243 |
| 6 | Entanglement entropy dynamics of Heisenberg chains. Journal of Statistical Mechanics: Theory and Experiment, 2006, 2006, P03001-P03001. | 0.9 | 224 |
| 7 | Decoherence induced by interacting quantum spin baths. Physical Review A, 2007, 75, . | 1.0 | 182 |
| 8 | Lattice gauge theory simulations in the quantum information era. Contemporary Physics, 2016, 57, 388-412. | 0.8 | 156 |
| 9 | Tensor Networks for Lattice Gauge Theories and Atomic Quantum Simulation. Physical Review Letters, 2014, 112, . | 2.9 | 116 |
| 10 | Robust Optimal Quantum Gates for Josephson Charge Qubits. Physical Review Letters, 2007, 99, 170501. | 2.9 | 109 |
| 11 | Real-Time Dynamics in U(1) Lattice Gauge Theories with Tensor Networks. Physical Review X, 2016, 6, . | 2.8 | 106 |
| 12 | Optimal control of complex atomic quantum systems. Scientific Reports, 2016, 6, 34187. | 1.6 | 105 |
| 13 | Phase Diagram of Spin-1 Bosons on One-Dimensional Lattices. Physical Review Letters, 2005, 95, 240404. | 2.9 | 101 |
| 14 | Positive Tensor Network Approach for Simulating Open Quantum Many-Body Systems. Physical Review Letters, 2016, 116, 237201. | 2.9 | 95 |
| 15 | From perfect to fractal transmission in spin chains. Physical Review A, 2005, 72, . | 1.0 | 94 |
| 16 | Communication at the quantum speed limit along a spin chain. Physical Review A, 2010, 82, . | 1.0 | 86 |
| 17 | Dressing the chopped-random-basis optimization: A bandwidth-limited access to the trap-free landscape. Physical Review A, 2015, 92, . | 1.0 | 83 |
| 18 | Information Theoretical Analysis of Quantum Optimal Control. Physical Review Letters, 2014, 113, 010502. | 2.9 | 81 |

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|---|---------|-----|-----------|
| 19 | Scalable quantum computation via local control of only two qubits. Physical Review A, 2010, 81, . | 1.0 | 80 |
| 20 | Interferometry with non-classical motional states of a Bose–Einstein condensate. Nature Communications, 2014, 5, 4009. | 5.8 | 80 |
| 21 | Speeding up and slowing down the relaxation of a qubit by optimal control. Physical Review A, 2013, 88, . | 1.0 | 75 |
| 22 | Quantum Multiscale Entanglement Renormalization Ansatz Channels. Physical Review Letters, 2008, 101, 180503. | 2.9 | 74 |
| 23 | Efficient Quantum Computing of Complex Dynamics. Physical Review Letters, 2001, 87, 227901. | 2.9 | 73 |
| 24 | Implementation of an experimentally feasible controlled-phase gate on two blockaded Rydberg atoms. Physical Review A, 2014, 89, . | 1.0 | 69 |
| 25 | Introduction to quantum optimal control for quantum sensing with nitrogen-vacancy centers in diamond. AVS Quantum Science, 2020, 2, . | 1.8 | 69 |
| 26 | The Tensor Networks Anthology: Simulation techniques for many-body quantum lattice systems. SciPost Physics Lecture Notes, 0, , . | 0.0 | 66 |
| 27 | Precise qubit control beyond the rotating wave approximation. New Journal of Physics, 2014, 16, 093022. | 1.2 | 64 |
| 28 | Lattice gauge tensor networks. New Journal of Physics, 2014, 16, 103015. | 1.2 | 61 |
| 29 | Quantum cloning in spin networks. Physical Review A, 2004, 70, . | 1.0 | 60 |
| 30 | Speeding up critical system dynamics through optimized evolution. Physical Review A, 2011, 84, . | 1.0 | 60 |
| 31 | Optimal control of atom transport for quantum gates in optical lattices. Physical Review A, 2008, 77, . | 1.0 | 56 |
| 32 | Adiabatic quenches through an extended quantum critical region. Physical Review B, 2008, 77, . | 1.1 | 54 |
| 33 | Transitionless quantum driving in open quantum systems. New Journal of Physics, 2014, 16, 053017. | 1.2 | 54 |
| 34 | Finite-representation approximation of lattice gauge theories at the continuum limit with tensor networks. Physical Review D, 2017, 95, . | 1.6 | 54 |
| 35 | Remote optimization of an ultracold atoms experiment by experts and citizen scientists. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E11231-E11237. | 3.3 | 53 |
| 36 | Fast closed-loop optimal control of ultracold atoms in an optical lattice. Physical Review A, 2013, 88, . | 1.0 | 51 |

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|---|---------|----|-----------|
| 37 | Introduction to Tensor Network Methods. , 2018, , . | | 50 |
| 38 | Unconstrained tree tensor network: An adaptive gauge picture for enhanced performance. Physical Review B, 2014, 90, . | 1.1 | 48 |
| 39 | Dissipation in adiabatic quantum computers: lessons from an exactly solvable model. New Journal of Physics, 2017, 19, 113029. | 1.2 | 45 |
| 40 | Coherent optimal control of photosynthetic molecules. Physical Review A, 2012, 85, . | 1.0 | 44 |
| 41 | Finite-density phase diagram of a(1+1)â˜dnon-abelian lattice gauge theory with tensor networks. Quantum - the Open Journal for Quantum Science, 0, 1, 9. | 0.0 | 44 |
| 42 | Fractional quantum Hall effect in the interacting Hofstadter model via tensor networks. Physical Review B, 2017, 96, . | 1.1 | 43 |
| 43 | Controlling the transport of an ion: classical and quantum mechanical solutions. New Journal of Physics, 2014, 16, 075007. | 1.2 | 42 |
| 44 | Lattice quantum electrodynamics in (3+1)-dimensions at finite density with tensor networks. Nature Communications, 2021, 12, 3600. | 5.8 | 41 |
| 45 | Homogeneous binary trees as ground states of quantum critical Hamiltonians. Physical Review A, 2010, 81, . | 1.0 | 40 |
| 46 | Room-temperature Rydberg single-photon source. Physical Review A, 2013, 87, . | 1.0 | 40 |
| 47 | Simulation of time evolution with multiscale entanglement renormalization ansatz. Physical Review A, 2008, 77, . | 1.0 | 38 |
| 48 | Quantum speed limit and optimal control of many-boson dynamics. Physical Review A, 2015, 92, . | 1.0 | 38 |
| 49 | Dynamics of Entanglement in Quantum Computers with Imperfections. Physical Review Letters, 2003, 91, 187901. | 2.9 | 37 |
| 50 | Universal aspects in the behavior of the entanglement spectrum in one dimension: Scaling transition at the factorization point and ordered entangled structures. Physical Review B, 2013, 88, . | 1.1 | 36 |
| 51 | A quantum optical valve in a nonlinear-linear resonators junction. Europhysics Letters, 2014, 106, 54003. | 0.7 | 36 |
| 52 | Optimizing for an arbitrary perfect entangler. II. Application. Physical Review A, 2015, 91, . | 1.0 | 36 |
| 53 | Decoherence by engineered quantum baths. Journal of Physics A: Mathematical and Theoretical, 2007, 40, 8033-8040. | 0.7 | 35 |
| 54 | Realistic and verifiable coherent control of excitonic states in a light-harvesting complex. New Journal of Physics, 2014, 16, 045007. | 1.2 | 35 |

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|---|---------|----|-----------| 
| 55 | One-dimensional many-body entangled open quantum systems with tensor network methods. Quantum Science and Technology, 2019, 4, 013001. | 2.6 | 35 |
| 56 | Demonstration of Quantum Brachistochrones between Distant States of an Atom. Physical Review X, 2021, 11, . | 2.8 | 33 |
| 57 | Enhancement of Pairwise Entanglement viaZ2Symmetry Breaking. Physical Review Letters, 2006, 97, 257201. | 2.9 | 32 |
| 58 | Optimized single-qubit gates for Josephson phase qubits. Physical Review B, 2009, 79, . | 1.1 | 32 |
| 59 | Efficiency of quantum controlled non-Markovian thermalization. New Journal of Physics, 2015, 17, 063031. | 1.2 | 32 |
| 60 | One decade of quantum optimal control in the chopped random basis. Reports on Progress in Physics, 2022, 85, 076001. | 8.1 | 31 |
| 61 | Dynamical localization simulated on a few-qubit quantum computer. Physical Review A, 2003, 67, . | 1.0 | 30 |
| 62 | Crossover from Classical to Quantum Kibble-Zurek Scaling. Physical Review Letters, 2016, 116, 225701. | 2.9 | 30 |
| 63 | Efficient Tensor Network *Ansatz* for High-Dimensional Quantum Many-Body Problems. Physical Review Letters, 2021, 126, 170603. | 2.9 | 30 |
| 64 | Real-time-dynamics quantum simulation of $(1+1)$ lattice QED with Rydberg atoms. Physical Review Research, 2020, 2, . | 1.3 | 29 |
| 65 | Complexity of controlling quantum many-body dynamics. Physical Review A, 2014, 89, . | 1.0 | 28 |
| 66 | Superfluid density and quasi-long-range order in the one-dimensional disordered Bose–Hubbard model. New Journal of Physics, 2016, 18, 015015. | 1.2 | 28 |
| 67 | Noise-resistant optimal spin squeezing via quantum control. Physical Review A, 2016, 93, . | 1.0 | 28 |
| 68 | Error budgeting for a controlled-phase gate with strontium-88 Rydberg atoms. Physical Review Research, 2022, 4, . | 1.3 | 28 |
| 69 | Increasing entanglement through engineered disorder in the random Ising chain. Physical Review B, 2007, 76, . | 1.1 | 26 |
| 70 | Autonomous calibration of single spin qubit operations. Npj Quantum Information, 2017, 3, . | 2.8 | 26 |
| 71 | Cloning transformations in spin networks without external control. Physical Review A, 2005, 72, . | 1.0 | 25 |
| 72 | Two-Dimensional Quantum-Link Lattice Quantum Electrodynamics at Finite Density. Physical Review X, 2020, 10, . | 2.8 | 24 |

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|---|---------|-----|-----------|
| 73 | Phase diagram and conformal string excitations of square ice using gauge invariant matrix product states. SciPost Physics, 2019, 6, . | 1.5 | 24 |
| 74 | Critical exponents with a multiscale entanglement renormalization Ansatz channel. Physical Review B, 2009, 80, . | 1.1 | 22 |
| 75 | Entangled quantum cellular automata, physical complexity, and Goldilocks rules. Quantum Science and Technology, 2021, 6, 045017. | 2.6 | 22 |
| 76 | Entanglement-storage units. New Journal of Physics, 2012, 14, 093041. | 1.2 | 21 |
| 77 | Tensor network simulation of an SU(3) lattice gauge theory in 1D. Physical Review D, 2019, 100, . | 1.6 | 21 |
| 78 | Two-Particle Interference with Double Twin-Atom Beams. Physical Review Letters, 2021, 126, 083603. | 2.9 | 21 |
| 79 | Dipole oscillations of confined lattice bosons in one dimension. Physical Review A, 2009, 79, . | 1.0 | 20 |
| 80 | Local shortcut to adiabaticity for quantum many-body systems. Physical Review A, 2016, 93, . | 1.0 | 20 |
| 81 | Charge and statistics of lattice quasiholes from density measurements: A tree tensor network study. Physical Review Research, 2020, 2, . | 1.3 | 20 |
| 82 | Homogeneous multiscale-entanglement-renormalization-ansatz states: An information theoretical analysis. Physical Review A, 2009, 79, . | 1.0 | 19 |
| 83 | Quantum Game of Life. Europhysics Letters, 2012, 97, 20012. | 0.7 | 19 |
| 84 | Full characterization of the quantum linear–zigzag transition in atomic chains. Annalen Der Physik, 2013, 525, 827-832. | 0.9 | 19 |
| 85 | Optimal preparation of quantum states on an atom-chip device. Physical Review A, 2016, 93, . | 1.0 | 19 |
| 86 | Entanglement generation in $(1+1)D$ QED scattering processes. Physical Review D, 2021, 104, . | 1.6 | 19 |
| 87 | Eigenstates of an operating quantum computer: hypersensitivity to static imperfections. European Physical Journal D, 2002, 20, 293-296. | 0.6 | 17 |
| 88 | Multipartite entanglement generation and fidelity decay in disordered qubit systems. Physical Review A, 2006, 73, . | 1.0 | 17 |
| 89 | Optimal control of Rydberg lattice gases. Quantum Science and Technology, 2017, 2, 035006. | 2.6 | 17 |
| 90 | From classical to quantum criticality. Physical Review B, 2014, 89, . | 1.1 | 16 |

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|---|---------|-----|-----------|
| 91 | Chaotic dynamics in superconducting nanocircuits. Europhysics Letters, 2005, 71, 893-899. | 0.7 | 15 |
| 92 | Trap-modulation spectroscopy of the Mott-insulator transition in optical lattices. Physical Review A, 2009, 79, . | 1.0 | 15 |
| 93 | An Optimal Control Framework for the Automated Design of Personalized Cancer Treatments. Frontiers in Bioengineering and Biotechnology, 2020, 8, 523. | 2.0 | 15 |
| 94 | Quantum-inspired machine learning on high-energy physics data. Npj Quantum Information, 2021, 7, . | 2.8 | 14 |
| 95 | *Ab initio* characterization of the quantum linear-zigzag transition using density matrix renormalization group calculations. Physical Review B, 2014, 89, . | 1.1 | 13 |
| 96 | Quantum billiards in optical lattices. Europhysics Letters, 2009, 88, 30006. | 0.7 | 12 |
| 97 | Amplification of the parametric dynamical Casimir effect via optimal control. Physical Review A, 2017, 96, . | 1.0 | 12 |
| 98 | Probabilistic low-rank factorization accelerates tensor network simulations of critical quantum many-body ground states. Physical Review E, 2018, 97, 013301. | 0.8 | 12 |
| 99 | Adaptive-weighted tree tensor networks for disordered quantum many-body systems. Physical Review B, 2022, 105, . | 1.1 | 12 |
| 100 | Dynamical imperfections in quantum computers. Physical Review A, 2005, 71, . | 1.0 | 11 |
| 101 | Entanglement production in chaotic quantum dots subject to spin-orbit coupling. Physical Review B, 2006, 74, . | 1.1 | 11 |
| 102 | Engineering and manipulating exciton wave packets. Physical Review B, 2017, 95, . | 1.1 | 11 |
| 103 | Superfluid-to-Mott transition in a Bose-Hubbard ring: Persistent currents and defect formation. Physical Review A, 2020, 101, . | 1.0 | 11 |
| 104 | The complexity of the logistic map at the chaos threshold. Physics Letters, Section A: General, Atomic and Solid State Physics, 2001, 285, 81-87. | 0.9 | 10 |
| 105 | Synthetic helical liquids with ultracold atoms in optical lattices. Physical Review B, 2015, 92, . | 1.1 | 10 |
| 106 | Violation of Bell inequalities in larger Hilbert spaces: robustness and challenges. New Journal of Physics, 2016, 18, 013021. | 1.2 | 10 |
| 107 | Fractal fidelity as a signature of quantum chaos. Physical Review A, 2007, 76, . | 1.0 | 9 |
| 108 | Spin chain model for correlated quantum channels. New Journal of Physics, 2008, 10, 115009. | 1.2 | 9 |

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|---|---------|-----|-----------|
| 109 | Quantum state reconstruction on atom-chips. New Journal of Physics, 2015, 17, 093024. | 1.2 | 9 |
| 110 | Kibble-Zurek scaling of the one-dimensional Bose-Hubbard model at finite temperatures. Physical Review A, 2018, 98, . | 1.0 | 9 |
| 111 | Dynamical Ginzburg criterion for the quantum-classical crossover of the Kibble-Zurek mechanism. Physical Review B, 2019, 100, . | 1.1 | 9 |
| 112 | Statistical properties of eigenvalues for an operating quantum computer with static imperfections. European Physical Journal D, 2003, 22, 285-293. | 0.6 | 8 |
| 113 | Dynamically localized systems: Exponential sensitivity of entanglement and efficient quantum simulations. Physical Review A, 2004, 70, . | 1.0 | 8 |
| 114 | Density of states of many-body quantum systems from tensor networks. Physical Review B, 2017, 96, . | 1.1 | 8 |
| 115 | Dynamical Localization Simulated on Actual Quantum Hardware. Entropy, 2021, 23, 654. | 1.1 | 7 |
| 116 | Hilbert curve vs Hilbert space: exploiting fractal 2D covering to increase tensor network efficiency. Quantum - the Open Journal for Quantum Science, 0, 5, 556. | 0.0 | 7 |
| 117 | Entanglement in the quantum Game of Life. Physical Review A, 2022, 105, . | 1.0 | 7 |
| 118 | Loop-free tensor networks for high-energy physics. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2022, 380, 20210065. | 1.6 | 7 |
| 119 | Homogeneous multiscale entanglement renormalization ansatz tensor networks for quantum critical systems. New Journal of Physics, 2010, 12, 075018. | 1.2 | 6 |
| 120 | On the descriptive power of Neural-Networks as constrained Tensor Networks with exponentially large bond dimension. SciPost Physics Core, 2021, 4, . | 0.9 | 6 |
| 121 | Robust magnetometry with single nitrogen-vacancy centers via two-step optimization. Physical Review A, 2022, 106, . | 1.0 | 6 |
| 122 | Quantum Computing and Information Extraction for Dynamical Quantum Systems. Quantum Information Processing, 2004, 3, 273-293. | 1.0 | 5 |
| 123 | Anti-ferromagnetic spinor BECs in optical lattices. Journal of Physics B: Atomic, Molecular and Optical Physics, 2006, 39, S163-S175. | 0.6 | 5 |
| 124 | Optimized Cooper pair pumps. Physical Review B, 2008, 77, . | 1.1 | 5 |
| 125 | Phonon-to-spin mapping in a system of a trapped ion via optimal control. Physical Review A, 2015, 92, . | 1.0 | 5 |
| 126 | MCTDHB Physics and Technologies: Excitations and Vorticity, Single-Shot Detection, Measurement of Fragmentation, and Optimal Control in Correlated Ultra-Cold Bosonic Many-Body Systems. , 2016, , 23-49. | | 5 |

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|---|---------|-----|-----------|
| 127 | Stability of Quantum Computing in the Presence of Imperfections. International Journal of Modern Physics B, 2003, 17, 3932-3946. | 1.0 | 4 |
| 128 | Information flow and error scaling for fully quantum control. Physical Review Research, 2022, 4, . | 1.3 | 4 |
| 129 | Non-extensive thermodynamics and stationary processes of localization. Chaos, Solitons and Fractals, 2000, 11, 2361-2369. | 2.5 | 3 |
| 130 | Optimal control for Rydberg quantum technology building blocks. Applied Physics B: Lasers and Optics, 2016, 122, 1. | 1.1 | 3 |
| 131 | Entanglement of Formation of Mixed Many-Body Quantum States via Tree Tensor Operators. Physical Review Letters, 2022, 128, 040501. | 2.9 | 3 |
| 132 | Probing models of information spreading in social networks. Journal of Physics A: Mathematical and Theoretical, 2014, 47, 435102. | 0.7 | 2 |
| 133 | Quantum optimal control within the rotating-wave approximation. Physical Review A, 2015, 92, . | 1.0 | 2 |
| 134 | IMPLEMENTATION OF QUANTUM COMMUNICATION PROTOCOLS IN JOSEPHSON JUNCTION ARRAYS. International Journal of Quantum Information, 2006, 04, 519-529. | 0.6 | 1 |
| 135 | Valence-bond states: Link models. Annals of Physics, 2009, 324, 1875-1896. | 1.0 | 1 |
| 136 | Exploration of experimental design and statistical methods using the <i>stick‑on‑the‑wall spaghetti</i> rule. Teaching Statistics, 2018, 40, 40-45. | 0.6 | 1 |
| 137 | Optimizing radiotherapy plans for cancer treatment with Tensor Networks. Physics in Medicine and Biology, 2021, 66, 125015. | 1.6 | 1 |
| 138 | A study of complexity in Gamma Ray Burst using the Diffusion Entropy approach. Astronomy and Astrophysics, 2004, 414, 1177-1184. | 2.1 | 1 |
| 139 | EFFECTS OF NOISE ON SPIN NETWORK CLONING. International Journal of Quantum Information, 2006, 04, 487-493. | 0.6 | 0 |
| 140 | Transport properties of a periodically driven superconducting single-electron transistor. Physical Review B, 2007, 75, . | 1.1 | 0 |
| 141 | Spin-chain-based full quantum computation by accessing only two spins. , 2011, , . | | 0 |
| 142 | Optimal driving of Bose-Einstein condensates in optical cavities. , 2014, , . | | 0 |
| 143 | Quantum Control of Quantum Solitons. , 2018, , . | | 0 |
| 144 | Quantum Computing and Information Extraction for Dynamical Quantum Systems. , 2005, , 273-293. | | 0 |