

# Markus Aspelmeyer

## List of Publications by Year in descending order

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151  
papers

21,516  
citations

17440

63  
h-index

19190

118  
g-index

156  
all docs

156  
docs citations

156  
times ranked

9322  
citing authors

#	ARTICLE	IF	CITATIONS
1	Cavity optomechanics. <i>Reviews of Modern Physics</i> , 2014, 86, 1391-1452.	45.6	4,064
2	Laser cooling of a nanomechanical oscillator into its quantum ground state. <i>Nature</i> , 2011, 478, 89-92.	27.8	1,866
3	Experimental one-way quantum computing. <i>Nature</i> , 2005, 434, 169-176.	27.8	1,027
4	Optomechanical Entanglement between a Movable Mirror and a Cavity Field. <i>Physical Review Letters</i> , 2007, 98, 030405.	7.8	888
5	Observation of strong coupling between a micromechanical resonator and an optical cavity field. <i>Nature</i> , 2009, 460, 724-727.	27.8	848
6	Self-cooling of a micromirror by radiation pressure. <i>Nature</i> , 2006, 444, 67-70.	27.8	819
7	Quantum optomechanics. <i>Physics Today</i> , 2012, 65, 29-35.	0.3	504
8	Ground-state cooling of a micromechanical oscillator: Comparing cold damping and cavity-assisted cooling schemes. <i>Physical Review A</i> , 2008, 77, .	2.5	475
9	Probing Planck-scale physics with quantum optics. <i>Nature Physics</i> , 2012, 8, 393-397.	16.7	473
10	De Broglie wavelength of a non-local four-photon state. <i>Nature</i> , 2004, 429, 158-161.	27.8	463
11	Squeezed light from a silicon micromechanical resonator. <i>Nature</i> , 2013, 500, 185-189.	27.8	458
12	Remote quantum entanglement between two micromechanical oscillators. <i>Nature</i> , 2018, 556, 473-477.	27.8	408
13	Large Quantum Superpositions and Interference of Massive Nanometer-Sized Objects. <i>Physical Review Letters</i> , 2011, 107, 020405.	7.8	373
14	Cooling of a levitated nanoparticle to the motional quantum ground state. <i>Science</i> , 2020, 367, 892-895.	12.6	367
15	Non-classical correlations between single photons and phonons from a mechanical oscillator. <i>Nature</i> , 2016, 530, 313-316.	27.8	348
16	An experimental test of non-local realism. <i>Nature</i> , 2007, 446, 871-875.	27.8	305
17	Demonstration of an ultracold micro-optomechanical oscillator in a cryogenic cavity. <i>Nature Physics</i> , 2009, 5, 485-488.	16.7	304
18	Tenfold reduction of Brownian noise in high-reflectivity optical coatings. <i>Nature Photonics</i> , 2013, 7, 644-650.	31.4	297

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19	Creating and Probing Multipartite Macroscopic Entanglement with Light. <i>Physical Review Letters</i> , 2007, 99, 250401.	7.8	267
20	Cavity cooling of an optically levitated submicron particle. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2013, 110, 14180-14185.	7.1	264
21	Quantum teleportation across the Danube. <i>Nature</i> , 2004, 430, 849-849.	27.8	261
22	Quantum optomechanics—throwing a glance [Invited]. <i>Journal of the Optical Society of America B: Optical Physics</i> , 2010, 27, A189.	2.1	247
23	Pulsed quantum optomechanics. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2011, 108, 16182-16187.	7.1	231
24	Quantum entanglement and teleportation in pulsed cavity optomechanics. <i>Physical Review A</i> , 2011, 84, .	2.5	199
25	Hanbury Brown and Twiss interferometry of single phonons from an optomechanical resonator. <i>Science</i> , 2017, 358, 203-206.	12.6	190
26	Optically levitating dielectrics in the quantum regime: Theory and protocols. <i>Physical Review A</i> , 2011, 83, .	2.5	187
27	Real-time optimal quantum control of mechanical motion at room temperature. <i>Nature</i> , 2021, 595, 373-377.	27.8	185
28	Long-distance quantum communication with entangled photons using satellites. <i>IEEE Journal of Selected Topics in Quantum Electronics</i> , 2003, 9, 1541-1551.	2.9	184
29	Long-Distance Free-Space Distribution of Quantum Entanglement. <i>Science</i> , 2003, 301, 621-623.	12.6	177
30	Experimental verification of the feasibility of a quantum channel between space and Earth. <i>New Journal of Physics</i> , 2008, 10, 033038.	2.9	177
31	Experimental Interference of Independent Photons. <i>Physical Review Letters</i> , 2006, 96, 240502.	7.8	171
32	Establishing Einstein-Poldosky-Rosen Channels between Nanomechanics and Atomic Ensembles. <i>Physical Review Letters</i> , 2009, 102, 020501.	7.8	155
33	Nonlocality of cluster states of qubits. <i>Physical Review A</i> , 2005, 71, .	2.5	148
34	Phonon-tunnelling dissipation in mechanical resonators. <i>Nature Communications</i> , 2011, 2, 231.	12.8	147
35	Levitodynamics: Levitation and control of microscopic objects in vacuum. <i>Science</i> , 2021, 374, eabg3027.	12.6	142
36	Observation of non-Markovian micromechanical Brownian motion. <i>Nature Communications</i> , 2015, 6, 7606.	12.8	141

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37	Quantum superposition of massive objects and the quantization of gravity. <i>Physical Review D</i> , 2018, 98, .	4.7	133
38	Cooling-by-measurement and mechanical state tomography via pulsed optomechanics. <i>Nature Communications</i> , 2013, 4, 2295.	12.8	132
39	High-performance near- and mid-infrared crystalline coatings. <i>Optica</i> , 2016, 3, 647.	9.3	132
40	Reduction of residual amplitude modulation to $1 \text{ \AA} - 10^{-6}$ for frequency modulation and laser stabilization. <i>Optics Letters</i> , 2014, 39, 1980.	3.3	125
41	Optomechanical Bell Test. <i>Physical Review Letters</i> , 2018, 121, 220404.	7.8	125
42	Happy centenary, photon. <i>Nature</i> , 2005, 433, 230-238.	27.8	116
43	Cavity Cooling of a Levitated Nanosphere by Coherent Scattering. <i>Physical Review Letters</i> , 2019, 122, 123602.	7.8	111
44	Experimental Violation of a Cluster State Bell Inequality. <i>Physical Review Letters</i> , 2005, 95, 020403.	7.8	108
45	Reconstructing the dynamics of a movable mirror in a detuned optical cavity. <i>New Journal of Physics</i> , 2006, 8, 107-107.	2.9	105
46	Single-photon opto-mechanics in the strong coupling regime. <i>New Journal of Physics</i> , 2010, 12, 083030.	2.9	102
47	Pulsed Laser Cooling for Cavity Optomechanical Resonators. <i>Physical Review Letters</i> , 2012, 108, 153601.	7.8	94
48	Experimental realization of freely propagating teleported qubits. <i>Nature</i> , 2003, 421, 721-725.	27.8	90
49	Silicon optomechanical crystal resonator at millikelvin temperatures. <i>Physical Review A</i> , 2014, 90, .	2.5	89
50	Direct frequency comb measurement of OD + CO $\hat{a}^{\dagger}$ DOCO kinetics. <i>Science</i> , 2016, 354, 444-448.	12.6	86
51	Focus on Mechanical Systems at the Quantum Limit. <i>New Journal of Physics</i> , 2008, 10, 095001.	2.9	85
52	Experimental Test of Nonlocal Realistic Theories Without the Rotational Symmetry Assumption. <i>Physical Review Letters</i> , 2007, 99, 210406.	7.8	84
53	Phase-noise induced limitations on cooling and coherent evolution in optomechanical systems. <i>Physical Review A</i> , 2009, 80, .	2.5	84
54	High-fidelity entanglement swapping with fully independent sources. <i>Physical Review A</i> , 2009, 79, .	2.5	77

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55	Space-quest, experiments with quantum entanglement in space. Europhysics News, 2009, 40, 26-29.	0.3	77
56	Macroscopic Quantum Resonators (MAQRO): 2015 update. EPJ Quantum Technology, 2016, 3, .	6.3	77
57	Laser noise in cavity-optomechanical cooling and thermometry. New Journal of Physics, 2013, 15, 035007.	2.9	76
58	A micromechanical proof-of-principle experiment for measuring the gravitational force of milligram masses. Classical and Quantum Gravity, 2016, 33, 125031.	4.0	76
59	Optimal State Estimation for Cavity Optomechanical Systems. Physical Review Letters, 2015, 114, 223601.	7.8	75
60	Macroscopic quantum resonators (MAQRO). Experimental Astronomy, 2012, 34, 123-164.	3.7	74
61	Measurement of gravitational coupling between millimetre-sized masses. Nature, 2021, 591, 225-228.	27.8	68
62	Quantum State Orthogonalization and a Toolset for Quantum Optomechanical Phonon Control. Physical Review Letters, 2013, 110, 010504.	7.8	67
63	Monocrystalline Al <sub>x</sub> Ga <sub>1-x</sub> As heterostructures for high-reflectivity high-Q micromechanical resonators in the megahertz regime. Applied Physics Letters, 2008, 92, .	3.3	65
64	Anti-symmetrization reveals hidden entanglement. New Journal of Physics, 2009, 11, 103052.	2.9	64
65	Quantum communications at ESA: Towards a space experiment on the ISS. Acta Astronautica, 2008, 63, 165-178.	3.2	63
66	Macroscopic Optomechanics from Displaced Single-Photon Entanglement. Physical Review Letters, 2014, 112, .	7.8	61
67	Satellite-based quantum communication terminal employing state-of-the-art technology. Journal of Optical Networking, 2005, 4, 549.	2.5	54
68	Radiation-pressure self-cooling of a micromirror in a cryogenic environment. Europhysics Letters, 2008, 81, 54003.	2.0	52
69	Influence of satellite motion on polarization qubits in a Space-Earth quantum communication link. Optics Express, 2006, 14, 10050.	3.4	49
70	Large Quantum Delocalization of a Levitated Nanoparticle Using Optimal Control: Applications for Force Sensing and Entangling via Weak Forces. Physical Review Letters, 2021, 127, 023601.	7.8	48
71	Optimized SESAMs for kilowatt-level ultrafast lasers. Optics Express, 2016, 24, 10512.	3.4	44
72	Quantum technology: from research to application. Applied Physics B: Lasers and Optics, 2016, 122, 1.	2.2	42

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73	Optical trapping and control of nanoparticles inside evacuated hollow core photonic crystal fibers. Applied Physics Letters, 2016, 108, .	3.3	41
74	Near-field coupling of a levitated nanoparticle to a photonic crystal cavity. Optica, 2018, 5, 1597.	9.3	37
75	Heralded generation of multiphoton entanglement. Physical Review A, 2007, 75, .	2.5	33
76	Cavity Optomechanics of Levitated Nanodumbbells: Nonequilibrium Phases and Self-Assembly. Physical Review Letters, 2013, 110, 143604.	7.8	33
77	High reflectivity high-Q micromechanical Bragg mirror. Applied Physics Letters, 2006, 89, 223101.	3.3	31
78	Levitated cavity optomechanics in high vacuum. Quantum Science and Technology, 2020, 5, 025006.	5.8	31
79	Coherent cancellation of photothermal noise in GaAs/Al <sub>0.92</sub> Ga <sub>0.08</sub> As Bragg mirrors. Metrologia, 2016, 53, 860-868.	1.2	29
80	Information content of the gravitational field of a quantum superposition. International Journal of Modern Physics D, 2019, 28, 1943001.	2.1	28
81	A quantum renaissance. Physics World, 2008, 21, 22-28.	0.0	24
82	Free-standing Al <sub>x</sub> Ga <sub>1-x</sub> As heterostructures by gas-phase etching of germanium. Applied Physics Letters, 2010, 96, .	3.3	24
83	Time-Continuous Bell Measurements. Physical Review Letters, 2013, 111, 170404.	7.8	24
84	Tensile-strained In <sub>x</sub> Ga <sub>1-x</sub> P membranes for cavity optomechanics. Applied Physics Letters, 2014, 104, .	3.3	21
85	Stationary optomechanical entanglement between a mechanical oscillator and its measurement apparatus. Physical Review Research, 2020, 2, .	3.6	21
86	Complementarity and Information in "Delayed-choice for Entanglement Swapping": Foundations of Physics, 2005, 35, 1909-1919.	1.3	20
87	Photonic entanglement as a resource in quantum computation and quantum communication. Journal of the Optical Society of America B: Optical Physics, 2007, 24, 241.	2.1	20
88	High-resolution x-ray reflectivity study of thin layered Pt-electrodes for integrated ferroelectric devices. Journal Physics D: Applied Physics, 2001, 34, A173-A178.	2.8	18
89	Proof-of-concept experiments for quantum physics in space. , 2004, 5161, 252.		18
90	Sensing earth's rotation with a helium-neon ring laser operating at 115 $\frac{1}{4}$ m. Optics Letters, 2015, 40, 1705-1708	3.40	18

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91	Femtosecond laser fabrication of high reflectivity micromirrors. Applied Physics Letters, 2010, 97, .	3.3	17
92	Space-to-ground quantum communication using an optical ground station: a feasibility study. , 2004, 5551, 113.		16
93	Thermal performance of a radiatively cooled system for quantum optomechanical experiments in space. Applied Thermal Engineering, 2016, 107, 689-699.	6.0	15
94	Detecting Nonclassical Correlations in Levitated Cavity Optomechanics. Physical Review Applied, 2020, 14, .	3.8	15
95	Entangled families. Nature, 2008, 455, 180-181.	27.8	14
96	Mechanical memory sees the light. Nature Nanotechnology, 2011, 6, 690-691.	31.5	13
97	How cold can you get in space? Quantum physics at cryogenic temperatures in space. New Journal of Physics, 2014, 16, 013058.	2.9	13
98	The surf is up. Nature, 2010, 464, 685-686.	27.8	12
99	Analytic solutions to the Maxwellâ€™London equations and levitation force for a superconducting sphere in a quadrupole field. Physica Scripta, 2019, 94, 125508.	2.5	12
100	Time-Dependent Aspects of the Athermal Martensitic Transformation: First Observation of Incubation Time in Niâ€™Al. Physica Status Solidi A, 1999, 174, R9-R10.	1.7	11
101	Solid-liquid interface of a 2-propanolâ€™perfluoromethylcyclohexane mixture: From adsorption to wetting. Physical Review E, 2002, 65, 061604.	2.1	10
102	Measured measurement. Nature Physics, 2009, 5, 11-12.	16.7	9
103	Megahertz monocrystalline optomechanical resonators with minimal dissipation. , 2010, , .		9
104	When Zeh Meets Feynman: How to Avoid the Appearance of Classical World in Gravity Experiments. Fundamental Theories of Physics, 2022, , 85-95.	0.3	9
105	Diffraction from tunable periodic structures II Experimental observation of electric fieldâ€™induced diffraction peaks. Applied Optics, 2002, 41, 5845.	2.1	8
106	Performing high-quality multi-photon experiments with parametric down-conversion. Journal of Physics B: Atomic, Molecular and Optical Physics, 2009, 42, 114008.	1.5	8
107	How to extend quantum experiments. Fortschritte Der Physik, 2009, 57, 1153-1162.	4.4	7
108	Logical independence and quantum randomness. New Journal of Physics, 2010, 12, 013019.	2.9	7

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109	Reduction of absorption losses in MOVPE-grown AlGaAs Bragg mirrors. Optics Letters, 2018, 43, 3522.	3.3	6
110	Martensitic relief formation on an electropolished Ni-37 at.% Al (001) surface by diffuse X-ray scattering under grazing angles. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1999, 273-275, 286-290.	5.6	5
111	Premonitory Martensitic Surface Relief Via Novel X-Ray Diffuse and Laser Light Reflectivity from The (001)-Surface of A Ni63Al37Single Crystal. Materials Research Society Symposia Proceedings, 1999, 580, 293.	0.1	3
112	Macroscopic quantum resonators in space. , 2011, , .		3
113	Diamonds take off. Nature Photonics, 2015, 9, 633-634.	31.4	3
114	Enlightened chips. Nature Photonics, 2007, 1, 94-95.	31.4	2
115	An experimental method to investigate the structure and kinetics of patterned surfaces using laser light diffraction. Review of Scientific Instruments, 2002, 73, 108-113.	1.3	1
116	Measurement and active compensation of polarization drifts in a fiber quantum channel used for teleportation. , 2003, , .		1
117	Course 9 Entangled photons and quantum communication. Les Houches Summer School Proceedings, 2004, 79, 337-355.	0.2	1
118	Quantum optomechanics. , 0, , 259-279.		1
119	Licht macht Druck. Physik in Unserer Zeit, 2011, 42, 276-284.	0.0	1
120	Strain profile and polarization enhancement in Ba <sub>0.5</sub> Sr <sub>0.5</sub> TiO <sub>3</sub> thin films. Physica Status Solidi (A) Applications and Materials Science, 2012, 209, 2255-2259.	1.8	1
121	Low-loss crystalline coatings for the near- and mid-infrared. , 2016, , .		1
122	Mid-infrared crystalline mirrors with ultralow optical losses. , 2017, , .		1
123	Advanced Quantum Communications Experiments with Entangled Photons. Optical Science and Engineering, 2005, , 45-81.	0.1	1
124	Optomechanical Schrödinger cats – a case for space. , 2013, , 123-132.		1
125	Phonon anomalies in displacive phase transitions by surface X-ray scattering. European Physical Journal Special Topics, 2003, 112, 123-127.	0.2	1
126	Non-postselected teleportation of single qubits. , 0, , .		0



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127	Active switching in long distance quantum state teleportation. , 0, , .		0
128	Nonlocal photon number states for quantum metrology. , 2004, , .		0
129	Quantum optical control of micro-mechanical resonators. , 2009, , .		0
130	Quantum opto-mechanics: Quantum optical control of massive mechanical resonators. , 2011, , .		0
131	Ein quantenoptischer Blick auf die Planck-Skala?. Physik in Unserer Zeit, 2012, 43, 163-164.	0.0	0
132	Suspended Mirrors: From Test Masses to Micromechanics. , 2014, , 57-81.		0
133	Quantum Optomechanics. , 2014, , .		0
134	Crystalline coatings for near-IR ring laser gyroscopes. , 2015, , .		0
135	Experimental opto-mechanics with levitated nanoparticles: towards quantum control and thermodynamic cycles (Presentation Recording). , 2015, , .		0
136	Peak-power scaling of femtosecond SESAM-modelocked Yb:Lu<math>_2\text{O}_3</math> thin-disk lasers. , 2017, , .		0
137	Ultrastable lasers based on low thermal noise optical resonators. , 2017, , .		0
138	High finesse semiconductor supermirrors. , 2017, , .		0
139	Thermal Noise in Ultrastable Cavity-Referenced Lasers. , 2017, , .		0
140	Growth kinetics of an athermal martensitic transformation by time-resolved optical diffraction from a Ni <sub>63</sub> Al <sub>37</sub> (001) surface. European Physical Journal Special Topics, 2003, 112, 151-157.	0.2	0
141	Quantum-Optical Control of Micromechanics. , 2008, , .		0
142	Space-to-Ground Single-Photon Link for the Realization of a Space Quantum Channel. , 2008, , .		0
143	Quantum-Opto-Mechanics in the Strong Coupling Regime. , 2010, , .		0
144	Quantum mechanics: The surf is up. Nature, 0, , .	27.8	0

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145	Quantum Optomechanics: QIPC and quantum foundations with massive mechanical systems. , 2011, , .		0
146	Quantum Optomechanics: a mechanical platform for quantum foundations and quantum information. , 2012, , .		0
147	Crystalline coatings for ultra-low-noise optical cavities. , 2013, , .		0
148	New Frontiers in Quantum Optomechanics: from levitation to gravitation. , 2016, , .		0
149	Advancements in Substrate-Transferred Crystalline Coatings. , 2016, , .		0
150	Mid-infrared crystalline supermirrors with ultralow optical absorption (Conference Presentation). , 2017, , .		0
151	Nanophotonic near-field levitated optomechanics. , 2019, , .		0