

Joel Fajans

List of Publications by Year in descending order

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162
papers

4,373
citations

87888

38
h-index

118850

62
g-index

166
all docs

166
docs citations

166
times ranked

1402
citing authors

#	ARTICLE	IF	CITATIONS
1	Trapped antihydrogen. Nature, 2010, 468, 673-676.	27.8	298
2	Confinement of antihydrogen for 1,000 seconds. Nature Physics, 2011, 7, 558-564.	16.7	238
3	Description and first application of a new technique to measure the gravitational mass of antihydrogen. Nature Communications, 2013, 4, 1785.	12.8	195
4	Autoresonant (nonstationary) excitation of pendulums, Plutinos, plasmas, and other nonlinear oscillators. American Journal of Physics, 2001, 69, 1096-1102.	0.7	169
5	Resonant quantum transitions in trapped antihydrogen atoms. Nature, 2012, 483, 439-443.	27.8	134
6	Observation of the $1S \leftrightarrow 2S$ transition in trapped antihydrogen. Nature, 2017, 541, 506-510.	27.8	122
7	Characterization of the $1S \leftrightarrow 2S$ transition in antihydrogen. Nature, 2018, 557, 71-75.	27.8	107
8	Observation of the hyperfine spectrum of antihydrogen. Nature, 2017, 548, 66-69.	27.8	101
9	Autoresonant (Nonstationary) Excitation of the Diocotron Mode in Non-neutral Plasmas. Physical Review Letters, 1999, 82, 4444-4447.	7.8	94
10	Evaporative Cooling of Antiprotons to Cryogenic Temperatures. Physical Review Letters, 2010, 105, 013003.	7.8	89
11	Microwave studies of a tunable free-electron laser in combined axial and wiggler magnetic fields. Physics of Fluids, 1985, 28, 1995.	1.4	83
12	Measurement of collisional anisotropic temperature relaxation in a strongly magnetized pure electron plasma. Physical Review Letters, 1992, 68, 317-320.	7.8	76
13	Antimatter Plasmas in a Multipole Trap for Antihydrogen. Physical Review Letters, 2007, 98, 023402.	7.8	75
14	Spectral Measurements from a Tunable, Raman, Free-Electron Laser. Physical Review Letters, 1984, 53, 246-249.	7.8	70
15	Experiments on two-dimensional vortex patterns. Physics of Fluids, 2000, 12, 289-293.	4.0	70
16	Temperature and anisotropic temperature relaxation measurements in cold, pure electron plasmas. Physics of Plasmas, 1996, 3, 1250-1258.	1.9	65
17	Antihydrogen accumulation for fundamental symmetry tests. Nature Communications, 2017, 8, 681.	12.8	64
18	Steering in bicycles and motorcycles. American Journal of Physics, 2000, 68, 654-659.	0.7	62

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19	Autoresonant Excitation of Antiproton Plasmas. <i>Physical Review Letters</i> , 2011, 106, 025002.	7.8	62
20	The effect of asymmetries on non-neutral plasma confinement time. <i>Physics of Plasmas</i> , 1994, 1, 1123-1127.	1.9	59
21	A magnetic trap for antihydrogen confinement. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2006, 566, 746-756.	1.6	57
22	Nonlinear Power Saturation and Phase (Wave Refractive Index) in a Collective Free-Electron Laser Amplifier. <i>Physical Review Letters</i> , 1986, 57, 579-582.	7.8	56
23	Effects of Extreme Magnetic Quadrupole Fields on Penning Traps and the Consequences for Antihydrogen Trapping. <i>Physical Review Letters</i> , 2005, 95, 155001.	7.8	53
24	Compression of Antiproton Clouds for Antihydrogen Trapping. <i>Physical Review Letters</i> , 2008, 100, 203401.	7.8	53
25	Experimental dynamics of an annulus of vorticity in a pure electron plasma. <i>Physics of Fluids A, Fluid Dynamics</i> , 1993, 5, 493-499.	1.6	52
26	The ALPHA antihydrogen trapping apparatus. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2014, 735, 319-340.	1.6	51
27	Observation of the $1S \rightarrow 2P$ Lyman- α transition in antihydrogen. <i>Nature</i> , 2018, 561, 211-215.	27.8	51
28	An improved limit on the charge of antihydrogen from stochastic acceleration. <i>Nature</i> , 2016, 529, 373-376.	27.8	48
29	Autoresonant (nonstationary) excitation of a collective nonlinear mode. <i>Physics of Plasmas</i> , 1999, 6, 4497-4503.	1.9	47
30	Quadrupole-Induced Resonant-Particle Transport in a Pure Electron Plasma. <i>Physical Review Letters</i> , 2003, 90, 015001.	7.8	47
31	Laser cooling of antihydrogen atoms. <i>Nature</i> , 2021, 592, 35-42.	27.8	47
32	A limitation to the analogy between pure electron plasmas and two-dimensional inviscid fluids. <i>Physics of Fluids B</i> , 1993, 5, 4295-4298.	1.7	46
33	Antimatter Interferometry for Gravity Measurements. <i>Physical Review Letters</i> , 2014, 112, 121102.	7.8	46
34	Search for trapped antihydrogen. <i>Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics</i> , 2011, 695, 95-104.	4.1	44
35	Investigation of the fine structure of antihydrogen. <i>Nature</i> , 2020, 578, 375-380.	27.8	43
36	Direct Excitation of High-Amplitude Chirped Bucket-BGK Modes. <i>Physical Review Letters</i> , 2003, 91, 265003.	7.8	41

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37	An experimental limit on the charge of antihydrogen. <i>Nature Communications</i> , 2014, 5, 3955.	12.8	40
38	Pure electron plasmas in asymmetric traps*. <i>Physics of Fluids B</i> , 1993, 5, 2378-2386.	1.7	39
39	Antiproton, positron, and electron imaging with a microchannel plate/phosphor detector. <i>Review of Scientific Instruments</i> , 2009, 80, 123701.	1.3	39
40	Plasma and trap-based techniques for science with antimatter. <i>Physics of Plasmas</i> , 2020, 27, 030601.	1.9	38
41	Measurements of amplification and phase shift (wave refractive index) in a free-electron laser. <i>Physics of Fluids</i> , 1986, 29, 3461.	1.4	37
42	Antihydrogen formation dynamics in a multipolar neutral anti-atom trap. <i>Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics</i> , 2010, 685, 141-145.	4.1	37
43	Off-axis electron orbits in realistic helical wigglers for free-electron-laser applications. <i>Physical Review A</i> , 1985, 32, 3448-3453.	2.5	35
44	Asymmetric stable equilibria of non-neutral plasmas. <i>Physical Review Letters</i> , 1992, 69, 3056-3059.	7.8	34
45	Experimental breaking of an adiabatic invariant. <i>Physical Review Letters</i> , 1993, 70, 3900-3903.	7.8	33
46	Observation of the ion resonance instability. <i>Physical Review Letters</i> , 1993, 70, 295-298.	7.8	33
47	Non-neutral plasma equilibria, trapping, separatrices, and separatrix crossing in magnetic mirrors. <i>Physics of Plasmas</i> , 2003, 10, 1209-1214.	1.9	32
48	Malmberg's Penning and Minimum-B trap compatibility: the advantages of higher-order multipole traps. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2004, 521, 318-325.	1.6	32
49	A pulsed microchannel-plate-based non-neutral plasma imaging system. <i>Review of Scientific Instruments</i> , 1993, 64, 52-55.	1.3	30
50	Production of antihydrogen at reduced magnetic field for anti-atom trapping. <i>Journal of Physics B: Atomic, Molecular and Optical Physics</i> , 2008, 41, 011001.	1.5	30
51	Dynamic and Debye shielding and anti-shielding. <i>Physics of Plasmas</i> , 1996, 3, 1820-1826.	1.9	29
52	Experimental Dynamics of a Vortex within a Vortex. <i>Physical Review Letters</i> , 2000, 85, 4052-4055.	7.8	28
53	Wave profile modification (optical guiding) induced by free-electron laser interaction. <i>Physical Review Letters</i> , 1987, 59, 1177-1180.	7.8	27
54	Second harmonic autoresonant control of the $l=1$ diocotron mode in pure-electron plasmas. <i>Physical Review E</i> , 2000, 62, 4131-4136.	2.1	27

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55	The effect of damping on autoresonant (nonstationary) excitation. <i>Physics of Plasmas</i> , 2001, 8, 423-427.	1.9	27
56	End effects of a bifilar magnetic wiggler. <i>Journal of Applied Physics</i> , 1984, 55, 43-50.	2.5	26
57	Non-neutral plasma shapes and edge profiles. <i>Physics of Fluids B</i> , 1990, 2, 693-699.	1.7	26
58	Centrifugal Separation and Equilibration Dynamics in an Electron-Antiproton Plasma. <i>Physical Review Letters</i> , 2011, 106, 145001.	7.8	26
59	Transient ion resonance instability. <i>Physics of Fluids B</i> , 1993, 5, 3127-3135.	1.7	25
60	Antihydrogen annihilation reconstruction with the ALPHA silicon detector. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2012, 684, 73-81.	1.6	24
61	Experiments with pure electron plasmas. <i>AIP Conference Proceedings</i> , 1988, , .	0.4	23
62	Asymmetric vortex merger: Experiments and simulations. <i>Physics of Plasmas</i> , 2001, 8, 3865-3868.	1.9	23
63	Dynamic and Debye Shielding and Antishielding in Magnetized, Collisionless Plasmas. <i>Physical Review Letters</i> , 1995, 74, 4209-4212.	7.8	22
64	Vacuum compatibility of 3D-printed materials. <i>Journal of Vacuum Science and Technology A: Vacuum, Surfaces and Films</i> , 2014, 32, .	2.1	22
65	Simulation studies of non-neutral plasma equilibria in an electrostatic trap with a magnetic mirror. <i>Physics of Plasmas</i> , 2007, 14, 052107.	1.9	20
66	Driven phase space holes and synchronized Bernstein, Greene, and Kruskal modes. <i>Physics of Plasmas</i> , 2004, 11, 4305-4317.	1.9	19
67	Critical loss radius in a Penning trap subject to multipole fields. <i>Physics of Plasmas</i> , 2008, 15, 032108.	1.9	19
68	Experimental and computational study of the injection of antiprotons into a positron plasma for antihydrogen production. <i>Physics of Plasmas</i> , 2013, 20, .	1.9	19
69	Nonlinear theory and experiment of collective free electron lasers. <i>Physics of Fluids B</i> , 1990, 2, 1626-1634.	1.7	18
70	Discriminating between antihydrogen and mirror-trapped antiprotons in a minimum-B trap. <i>New Journal of Physics</i> , 2012, 14, 015010.	2.9	18
71	Enhanced Control and Reproducibility of Non-Neutral Plasmas. <i>Physical Review Letters</i> , 2018, 120, 025001.	7.8	18
72	Sympathetic cooling of positrons to cryogenic temperatures for antihydrogen production. <i>Nature Communications</i> , 2021, 12, 6139.	12.8	18

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73	In situ electromagnetic field diagnostics with an electron plasma in a Penningâ€“Malmberg trap. New Journal of Physics, 2014, 16, 013037.	2.9	17
74	Subharmonic autoresonance of the diocotron mode. Physics of Plasmas, 2000, 7, 1712-1718.	1.9	16
75	Nonlinear dynamics of anti-hydrogen in magnetostatic traps: implications for gravitational measurements. Classical and Quantum Gravity, 2013, 30, 205014.	4.0	16
76	Simulations of plasma confinement in an antihydrogen trap. Physics of Plasmas, 2007, 14, 102111.	1.9	15
77	Numerical studies of driven, chirped Bernstein, Greene, and Kruskal modes. Physics of Plasmas, 2005, 12, 062112.	1.9	13
78	Antihydrogen Physics at ALPHA/CERN This paper was presented at the International Conference on Precision Physics of Simple Atomic Systems, held at University of Windsor, Windsor, Ontario, Canada on 21â€“26 July 2008.. Canadian Journal of Physics, 2009, 87, 791-797.	1.1	13
79	Investigation of two-frequency Paul traps for antihydrogen production. Hyperfine Interactions, 2017, 238, 1.	0.5	13
80	Development of a pure cryogenic positron plasma using a LINAC positron source. Hyperfine Interactions, 1993, 76, 135-142.	0.5	12
81	Equilibrium of highly asymmetric non-neutral plasmas. Physics of Plasmas, 1999, 6, 12-18.	1.9	12
82	Photocathode source for studying two-dimensional fluid phenomena with magnetized electron columns. Review of Scientific Instruments, 1999, 70, 4539-4541.	1.3	12
83	Trapped antihydrogen. Hyperfine Interactions, 2012, 212, 15-29.	0.5	12
84	Stability of highly asymmetric non-neutral plasmas. Physics of Plasmas, 1999, 6, 19-30.	1.9	11
85	Particle Physics Aspects of Antihydrogen Studies with ALPHA at CERN. AIP Conference Proceedings, 2008, , .	0.4	11
86	Collapse and winding of an asymmetric annulus of vorticity. Journal of Fluid Mechanics, 1993, 252, 713-720.	3.4	9
87	Bifurcations in elliptical, asymmetric non-neutral plasmas. Physics of Plasmas, 2000, 7, 3929.	1.9	9
88	Decay of the Diocotron Rotation and Transport in a New Low-Density Asymmetry-Dominated Regime. Physical Review Letters, 2002, 89, 105002.	7.8	9
89	Effect of electron beam temperature on the gain of a collective free-electron laser. IEEE Journal of Quantum Electronics, 1987, 23, 1617-1620.	1.9	8
90	A novel antiproton radial diagnostic based on octupole induced ballistic loss. Physics of Plasmas, 2008, 15, 032107.	1.9	8

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91	Progress towards microwave spectroscopy of trapped antihydrogen. <i>Hyperfine Interactions</i> , 2012, 212, 81-90.	0.5	7
92	Silicon vertex detector upgrade in the ALPHA experiment. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2013, 732, 134-136.	1.6	7
93	Saturation in α -nonmagnetic-stainless steel. <i>Review of Scientific Instruments</i> , 1998, 69, 3695-3696.	1.3	6
94	Breaking of Rotational Symmetry in Cylindrically Bounded 2D Electron Plasmas and 2D Fluids. <i>Physical Review Letters</i> , 2004, 93, 215002.	7.8	6
95	Axial to transverse energy mixing dynamics in octupole-based magnetostatic antihydrogen traps. <i>New Journal of Physics</i> , 2018, 20, 053003.	2.9	6
96	Plasma shielding, Vlasov's equation, and the unperturbed-orbits technique. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 1999, 258, 145-148.	2.1	5
97	Injection into Electron Plasma Traps. <i>AIP Conference Proceedings</i> , 2003, , .	0.4	5
98	Magnetic multipole induced zero-rotation frequency bounce-resonant loss in a Penning-Malmberg trap used for antihydrogen trapping. <i>Physics of Plasmas</i> , 2009, 16, 100702.	1.9	5
99	The ALPHA α detector: Module Production and Assembly. <i>Journal of Instrumentation</i> , 2012, 7, C01051-C01051.	1.2	5
100	Electron Plasmas Cooled by Cyclotron-Cavity Resonance. <i>Physical Review Letters</i> , 2016, 117, 175001.	7.8	5
101	Low magnetic field cooling of lepton plasmas via cyclotron-cavity resonance. <i>Physics of Plasmas</i> , 2018, 25, .	1.9	5
102	Electron cyclotron resonance (ECR) magnetometry with a plasma reservoir. <i>Physics of Plasmas</i> , 2020, 27, .	1.9	5
103	Proposed search for resonant states in positron-electron scattering using a positron gas target. <i>Nuclear Instruments & Methods in Physics Research B</i> , 1991, 56-57, 599-603.	1.4	4
104	Search for Resonant States in Positron Electron Scattering. <i>Materials Science Forum</i> , 1992, 105-110, 529-532.	0.3	4
105	Three-dimensional non-neutral plasma shapes. <i>Physics of Fluids B</i> , 1993, 5, 4250-4252.	1.7	4
106	Application of Contour Dynamics to Systems with Cylindrical Boundaries. <i>Journal of Computational Physics</i> , 1998, 145, 462-468.	3.8	4
107	Solving Poisson's equation with interior conditions. <i>Journal of Mathematical Physics</i> , 1998, 39, 6720-6729.	1.1	4
108	The ALPHA Experiment: A Cold Antihydrogen Trap. <i>AIP Conference Proceedings</i> , 2005, , .	0.4	4

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109	Simple loss scaling laws for quadrupoles and higher-order multipoles used in antihydrogen traps. AIP Conference Proceedings, 2006, , .	0.4	4
110	Towards trapped antihydrogen. Nuclear Instruments & Methods in Physics Research B, 2008, 266, 357-362.	1.4	4
111	First Attempts at Antihydrogen Trapping in ALPHA. AIP Conference Proceedings, 2008, , .	0.4	4
112	Using stochastic acceleration to place experimental limits on the charge of antihydrogen. New Journal of Physics, 2014, 16, 083013.	2.9	4
113	Antiproton cloud compression in the ALPHA apparatus at CERN. Hyperfine Interactions, 2015, 235, 21-28.	0.5	4
114	Plasma temperature measurement with a silicon photomultiplier (SiPM). Review of Scientific Instruments, 2020, 91, 103502.	1.3	4
115	<title>Three-Dimensional Display</title>. Proceedings of SPIE, 1979, , .	0.8	3
116	Comments on "Study of gain, bandwidth, and tunability of a millimeter-wave free-electron laser operating in the collective regime" [Phys. Fluids 26, 2683 (1983)]. Physics of Fluids, 1985, 28, 3177.	1.4	3
117	Waveguide mode deformation in free-electron lasers. Physics of Fluids B, 1989, 1, 2073-2084.	1.7	3
118	Shielding from instantaneously and adiabatically applied potential wells in collisionless plasmas. Physics of Plasmas, 2002, 9, 1091-1094.	1.9	3
119	Towards antihydrogen confinement with the ALPHA antihydrogen trap. Hyperfine Interactions, 2006, 172, 81-89.	0.5	3
120	Thermalization of magnetized electrons from black body radiation. Journal of Physics B: Atomic, Molecular and Optical Physics, 2007, 40, 3143-3152.	1.5	3
121	Suppression of feedback oscillations in free-electron lasers. IEEE Journal of Quantum Electronics, 1988, 24, 18005-18006.	1.9	2
122	Efficient calculations of magnetic fields of solenoids for simulations. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2022, 1034, 166706.	1.6	2
123	Bifilar helical wiggler magnet inductance. Review of Scientific Instruments, 1989, 60, 3073-3074.	1.3	1
124	Stability of highly deformed, asymmetric single-species plasmas. AIP Conference Proceedings, 1995, , .	0.4	1
125	Quadrupole induced resonant particle transport in a pure electron plasma. , 1999, , .		1
126	A selection of experiments performed with the photocathode trap. , 1999, , .		1

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145	Antiparticle plasmas for antihydrogen trapping. , 2012, , .		0
146	Antihydrogen formation by autoresonant excitation of antiproton plasmas. Hyperfine Interactions, 2012, 212, 61-67.	0.5	0
147	Antihydrogen detection in ALPHA. Hyperfine Interactions, 2012, 212, 91-99.	0.5	0
148	Microwave-plasma interactions studied via mode diagnostics in ALPHA. Hyperfine Interactions, 2012, 212, 117-123.	0.5	0
149	Autoresonant-spectrometric determination of the residual gas composition in the ALPHA experiment apparatus. Review of Scientific Instruments, 2013, 84, 065110.	1.3	0
150	Evaporative cooling of antiprotons for the production of trappable antihydrogen. , 2013, , .		0
151	AUTORESONANCE. Advanced Textbooks in Physics, 2016, , 255-274.	0.1	0
152	Limit on the electric charge of antihydrogen. Hyperfine Interactions, 2017, 238, 1.	0.5	0
153	Cyclotron cooling phenomena in an electrode stack which traps microwaves. AIP Conference Proceedings, 2018, , .	0.4	0
154	The ALPHA-g Antihydrogen Gravity Magnet System. IEEE Transactions on Applied Superconductivity, 2020, 30, 1-5.	1.7	0
155	Inviscid Two-Dimensional Fluid Dynamics Experiments with Magnetized Electron Columns. Lecture Notes in Physics, 2001, , 319-327.	0.7	0
156	Towards antihydrogen confinement with the ALPHA antihydrogen trap. , 2007, , 81-89.		0
157	ALPHA ANTIHYDROGEN EXPERIMENT. , 2010, , .		0
158	Trapped antihydrogen. , 2011, , 15-29.		0
159	Progress towards microwave spectroscopy of trapped antihydrogen. , 2011, , 81-90.		0
160	Towards antihydrogen trapping and spectroscopy at ALPHA. , 2011, , 39-48.		0
161	Microwave-plasma interactions studied via mode diagnostics in ALPHA. , 2012, , 117-123.		0
162	The Role of Nonneutral Plasma Physics in Antihydrogen Synthesis. , 2020, , .		0