

# W N Hardy

## List of Publications by Year in descending order

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119  
papers

7,825  
citations

53794

45  
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48315

88  
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119  
all docs

119  
docs citations

119  
times ranked

4611  
citing authors

#	ARTICLE	IF	CITATIONS
1	Direct observation of competition between superconductivity and charge density wave order in $\text{YBa}_2\text{Cu}_3\text{O}_{6.67}$ . Nature Physics, 2012, 8, 871-876.	16.7	924
2	Magnetic-field-induced charge-stripe order in the high-temperature superconductor $\text{YBa}_2\text{Cu}_3\text{O}_y$ . Nature, 2011, 477, 191-194.	27.8	660
3	Change of carrier density at the pseudogap critical point of a cuprate superconductor. Nature, 2016, 531, 210-214.	27.8	296
4	Three-dimensional charge density wave order in $\text{YBa}_2\text{Cu}_3\text{O}_{6.67}$ at high magnetic fields. Science, 2015, 350, 949-952.	12.6	280
5	Distinct Charge Orders in the Planes and Chains of Ortho-II Ordered $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ . Physical Review Letters, 2012, 109, 67001.	7.8	254
6	X-Ray Diffraction Observations of a Charge-Density-Wave Order in Superconducting Ortho-II $\text{YBa}_2\text{Cu}_3\text{O}_{6.54}$ Single Crystals in Zero Magnetic Field. Physical Review Letters, 2013, 110, 137004.	21.1	211
7	Incipient charge order observed by NMR in the normal state of $\text{YBa}_2\text{Cu}_3\text{O}_y$ . Nature Communications, 2015, 6, 6438.	12.8	211
8	Thermodynamic phase diagram of static charge order in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_y$ . Nature Physics, 2013, 9, 79-83.	16.7	205
9	Symmetry of charge order in cuprates. Nature Materials, 2015, 14, 796-800.	27.5	195
10	Lifshitz critical point in the cuprate superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ . Physical Review Letters, 2014, 112, 107001.	3.2	189
11	Charge order in the cuprate superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ . Physical Review B, 2014, 90, 040401.	3.2	185
12	In situ doping control of the surface of high-temperature superconductors. Nature Physics, 2008, 4, 527-531.	16.7	175
13	Direct measurement of the upper critical field in cuprate superconductors. Nature Communications, 2014, 5, 3280.	12.8	171
14	Quasiparticle mass enhancement approaching optimal doping in a high- $T_c$ superconductor. Science, 2015, 348, 317-320.	12.6	159
15	Broken translational and rotational symmetry via charge stripe order in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ . Science, 2015, 347, 1335-1339.	12.6	149
16	A global inversion-symmetry-broken phase inside the pseudogap region of $\text{YBa}_2\text{Cu}_3\text{O}_y$ . Nature Physics, 2017, 13, 250-254.	16.7	142
17	Magnetic field controlled charge density wave coupling in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ . Nature Communications, 2016, 7, 11494.	12.8	134
18	Observation of the $1S \leftrightarrow 2S$ transition in trapped antihydrogen. Nature, 2017, 541, 506-510.	27.8	122

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19	Heat capacity through the magnetic-field-induced resistive transition in an underdoped high-temperature superconductor. Nature Physics, 2011, 7, 332-335.	16.7	116
20	Characterization of the 1S $\rightarrow$ 2S transition in antihydrogen. Nature, 2018, 557, 71-75.	27.8	107
21	Loss of nodal quasiparticle integrity in underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+x</sub> . Nature Physics, 2010, 6, 905-911.	16.7	103
22	Field Induced Reduction of the Low-Temperature Superfluid Density in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.95</sub> . Physical Review Letters, 1999, 83, 4156-4159.	7.8	101
23	Observation of the hyperfine spectrum of antihydrogen. Nature, 2017, 548, 66-69.	27.8	101
24	Surface impedance studies of YBCO. European Physical Journal D, 1996, 46, 3195-3202.	0.4	91
25	Pseudogap temperature $T^*$ of cuprate superconductors from the Nernst effect. Physical Review B, 2018, 97, .	12.8	99
26	Normal-state nodal electronic structure in underdoped high-T <sub>c</sub> copper oxides. Nature, 2014, 511, 61-64.	27.8	85
27	Dispersive spin excitations in highly overdoped cuprates revealed by resonant inelastic x-ray scattering. Physical Review B, 2013, 88, .	3.2	83
28	Ideal charge-density-wave order in the high-field state of superconducting YBCO. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, 14645-14650.	7.1	83
29	The microscopic structure of charge density waves in underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.54</sub> revealed by X-ray diffraction. Nature Communications, 2015, 6, 10064.	12.8	78
30	Two types of nematicity in the phase diagram of the cuprate superconductor YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Physical Review B, 2015, 92, .	3.2	73
31	a-axis optical conductivity of detwinned ortho-II YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.50</sub> . Physical Review B, 2006, 73, .	3.2	69
32	Angle dependence of quantum oscillations in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.59</sub> shows free-spin behaviour of quasiparticles. Nature Physics, 2011, 7, 234-238.	16.7	69
33	Anomalous thermal diffusivity in underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+x</sub> . Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, 5378-5383.	7.1	67
34	Antihydrogen accumulation for fundamental symmetry tests. Nature Communications, 2017, 8, 681.	12.8	64
35	New collective mode in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Physical Review B, 2015, 92, .	3.2	62
36	Evidence for a small hole pocket in the Fermi surface of underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Nature Communications, 2015, 6, 6034.	12.8	60

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37	Inelastic x-ray study of phonon broadening and charge-density wave formation in ortho-II-ordered YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.54</sub> . Physical Review B, 2013, 88, .	3.2	57
38	Compensated electron and hole pockets in an underdoped high- $T_c$ superconductor YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2010, 81, .	3.2	55
39	Observation of the 1S $\rightarrow$ 2P Lyman- $\alpha$ transition in antihydrogen. Nature, 2018, 561, 211-215.	27.8	51
40	Bound states of defects in superconducting LiFeAs studied by scanning tunneling spectroscopy. Physical Review B, 2012, 86, .	3.2	50
41	Impact of Quenched Oxygen Disorder on Charge Density Wave Order in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6-x</sub> . Physical Review Letters, 2014, 113, 107002.	3.2	48
42	An improved limit on the charge of antihydrogen from stochastic acceleration. Nature, 2016, 529, 373-376.	27.8	48
43	Thermal Conductivity of the Iron-Based Superconductor FeSe: Nodeless Gap with a Strong Two-Band Character. Physical Review Letters, 2016, 117, 097003.	7.8	47
44	Laser cooling of antihydrogen atoms. Nature, 2021, 592, 35-42.	27.8	47
45	Vortex lattice melting and underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6-x</sub> . Resonant elastic soft x-ray scattering in oxygen-ordered YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6-x</sub> . Physical Review B, 2014, 89, 104507.	3.2	46
46	Resonant elastic soft x-ray scattering in oxygen-ordered YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6-x</sub> . Physical Review B, 2014, 89, 104507.	3.2	45
47	Orbital symmetry of charge-density-wave order in La <sub>1.875</sub> Ba <sub>0.125</sub> CuO <sub>4</sub> and YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.67</sub> . Nature Materials, 2016, 15, 616-620.	27.5	45
48	Two-dimensional vortex behavior in highly underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6-x</sub> . Physical Review B, 2014, 89, 104507.	3.2	44
49	Atomic scale real-space mapping of holes in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+<math>\delta</math></sub> . Nature Communications, 2014, 5, 4275.	12.8	42
50	Thermal Hall conductivity in the cuprate Mott insulators Nd <sub>2</sub> CuO <sub>4</sub> and Sr <sub>2</sub> CuO <sub>2</sub> Cl <sub>2</sub> . Nature Communications, 2020, 11, 5325.	12.8	42
51	Correlations between charge ordering and local magnetic fields in overdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+x</sub> . Physical Review B, 2002, 66, .	3.2	40
52	Sign inversion in the superconducting order parameter of LiFeAs inferred from Bogoliubov quasiparticle interference. Physical Review B, 2014, 89, .	3.2	40
53	An experimental limit on the charge of antihydrogen. Nature Communications, 2014, 5, 3955.	12.8	40
54	Fermi-liquid behavior in an underdoped high- $T_c$ superconductor YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2010, 81, .	3.2	37

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55	Direct measurement of the London penetration depth in $YBa_2Cu_3O_{6.5}$ and $YBa_2Cu_3O_{6.993}$ . <i>Physical Review B</i> , 2010, 81, .	3.2	37
56	Phenomenology of $a_1$ -axis and $b_1$ -axis charge dynamics from microwave spectroscopy of highly ordered $YBa_2Cu_3O_{6.5}$ and $YBa_2Cu_3O_{6.993}$ . <i>Physical Review B</i> , 2006, 74, .	3.2	32
57	Spin susceptibility of charge-ordered $YBa_2Cu_3O_{7-x}$ across the upper critical field. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2017, 114, 13148-13153.	7.1	32
58	Unusual Interplay between Superconductivity and Field-Induced Charge Order in $YBa_2Cu_3O_{7-x}$ . <i>Physical Review Letters</i> , 2018, 121, 077001.	7.8	32
59	Influence of Spin-Orbit Coupling in Iron-Based Superconductors. <i>Physical Review Letters</i> , 2018, 121, 076401.	3.2	32
60	Phonon Screening in High-Temperature Superconductors. <i>Physical Review Letters</i> , 2000, 84, 5391-5394.	7.8	31
61	Bolometric technique for high-resolution broadband microwave spectroscopy of ultra-low-loss samples. <i>Review of Scientific Instruments</i> , 2004, 75, 124-135.	1.3	30
62	Nernst effect in the cuprate superconductor $YBa_2Cu_3O_{7-x}$ . <i>Physical Review B</i> , 2016, 93, .	3.2	30
63	Influence of Spin-Orbit Coupling in Iron-Based Superconductors. <i>Physical Review Letters</i> , 2018, 121, 076401.	7.8	30
64	Wiedemann-Franz law in the underdoped cuprate superconductor $YBa_2Cu_3O_{7-x}$ . <i>Physical Review B</i> , 2016, 93, .	3.2	29
65	The rate of quasiparticle recombination probes the onset of coherence in cuprate superconductors. <i>Scientific Reports</i> , 2016, 6, 23610.	3.3	27
66	Lattice dynamical signature of charge density wave formation in underdoped $YBa_2Cu_3O_{6+x}$ . <i>Physical Review B</i> , 2013, 88, .	3.2	25
67	No evidence for orbital loop currents in charge-ordered $YBa_2Cu_3O_{6+x}$ from polarized neutron diffraction. <i>Physical Review B</i> , 2017, 96, .	3.2	23
68	Imaging the real space structure of the spin fluctuations in an iron-based superconductor. <i>Nature Communications</i> , 2017, 8, 15996.	12.8	22
69	Enhanced charge density wave coherence in a light-quenched, high-temperature superconductor. <i>Science</i> , 2022, 376, 860-864.	12.6	22
70	Absolute value and temperature dependence of the magnetic penetration depth in $Ba(Co_{1-x}Fe_x)_2As_2$ . <i>Physical Review B</i> , 2011, 84, .	3.2	21
71	Pair breaking versus symmetry breaking: Origin of the Raman modes in superconducting cuprates. <i>Physical Review B</i> , 2011, 84, .	3.2	20
72	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

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73	Locally commensurate charge-density wave with three-unit-cell periodicity in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Nature Communications, 2021, 12, 3274.	12.8	19
74	Microwave conductivity and superfluid density in strongly overdoped Tl <sub>2</sub> BaCuO <sub>2</sub> . Physical Review Letters, 2018, 120, 025001.	3.2	18
75	Enhanced Control and Reproducibility of Non-Neutral Plasmas. Physical Review Letters, 2018, 120, 025001.	7.8	18
76	Coherent c-axis transport in the underdoped cuprate superconductor YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Physical Review B, 2012, 85, .	3.2	17
77	NMR evidence for Friedel-like oscillations in the CuO chains of ortho-II YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2006, 73, .	3.2	16
78	Thermodynamic signature of a magnetic-field-driven phase transition within the superconducting state of an underdoped cuprate. Nature Physics, 2016, 12, 47-51.	16.7	14
79	Nuclear magnetic resonance study of charge density waves under hydrostatic pressure in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2019, 100, .	3.2	14
80	Spatially inhomogeneous competition between superconductivity and the charge density wave in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.67</sub> . Nature Communications, 2020, 11, 990.	12.8	13
81	Trapped antihydrogen. Hyperfine Interactions, 2012, 212, 15-29.	0.5	12
82	Particle Physics Aspects of Antihydrogen Studies with ALPHA at CERN. AIP Conference Proceedings, 2008, , .	0.4	11
83	Disorder-induced power-law response of a superconducting vortex on a plane. Physical Review B, 2015, 92, .	3.2	11
84	Controlling the near-surface superfluid density in underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+x</sub> by photo-illumination. Scientific Reports, 2014, 4, 6250.	3.3	11
85	NMR study of oxygen disorder in ortho-II YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2019, 100, .	3.2	11
86	Investigation of potential fluctuating intra-unit cell magnetic order in cuprates by <sup>137</sup> Sr NMR. Physical Review B, 2016, 94, .	3.2	11
87	Resolving the nature of electronic excitations in resonant inelastic x-ray scattering. Physical Review B, 2019, 99, .	3.2	11
88	Magnetization of underdoped YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> above the irreversibility field. Physical Review B, 2015, 92, .	3.2	10
89	Quasiparticle Scattering off Defects and Possible Bound States in Charge-Ordered YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> . Physical Review Letters, 2017, 118, 017001.	7.8	10
90	Oxygen chain disorder as the weak scattering source in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Physical Review B, 2010, 82, .	3.2	9

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91	Orbital symmetries of charge density wave order in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ . <i>Science Advances</i> , 2020, 6, .	10.3	9
92	A novel antiproton radial diagnostic based on octupole induced ballistic loss. <i>Physics of Plasmas</i> , 2008, 15, 032107.	1.9	8
93	Comment on "Nodeless pairing state in single-crystal $\text{YBa}_2\text{Cu}_3\text{O}_7$ ". <i>Physical Review B</i> , 2005, 72, .	3.2	7
94	Response to Comment on "Broken translational and rotational symmetry via charge stripe order in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_{6+y}$ ". <i>Science</i> , 2016, 351, 235-235.	12.6	7
95	Top-Seeded Melt-Growth of $\text{YBa}_2\text{Cu}_3\text{O}_x$ Crystals for Neutron Diffraction Studies. <i>Journal of Superconductivity and Novel Magnetism</i> , 2002, 15, 531-534.	0.5	6
96	Microwave spectroscopy of vortex dynamics in ortho-II $\text{YBa}_2\text{Cu}_3\text{O}_x$ . <i>Physical Review B</i> , 2009, 80, .	3.2	6
97	Stability of nodal quasiparticles in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_x$ by penetration depth and microwave spectroscopy. <i>Physical Review B</i> , 2009, 80, .	3.2	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 "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	Open microwave cavity for use in a Purcell enhancement cooling scheme. <i>Review of Scientific Instruments</i> , 2016, 87, 104702.	1.3	5
102	Low magnetic field cooling of lepton plasmas via cyclotron-cavity resonance. <i>Physics of Plasmas</i> , 2018, 25, .	1.9	5
103	Reply to "Comment on "No evidence for orbital loop currents in charge-ordered $\text{YBa}_2\text{Cu}_3\text{O}_x$ from polarized neutron diffraction". <i>Physical Review B</i> , 2018, 98, .	3.2	5
104	First Attempts at Antihydrogen Trapping in ALPHA. <i>AIP Conference Proceedings</i> , 2008, , .	0.4	4
105	Separation of magnetic and superconducting behavior in $\text{YBa}_2\text{Cu}_3\text{O}_{6.33}$ ( $T_c=8.4\text{K}$ ). <i>Physical Review B</i> , 2015, 91, .	3.2	4
106	Antiproton cloud compression in the ALPHA apparatus at CERN. <i>Hyperfine Interactions</i> , 2015, 235, 21-28.	0.5	4
107	Logarithmic Upturn in Low-Temperature Electronic Transport as a Signature of $d$ -Wave Order in Cuprate Superconductors. <i>Physical Review Letters</i> , 2018, 121, 267004.	7.8	4
108	Three-dimensional electronic structure of $\text{LiFeAs}$ . <i>Physical Review B</i> , 2022, 105, .	3.2	4

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109	A new radiative heater for high Tc thin film growth. Review of Scientific Instruments, 1998, 69, 3326-3330.	1.3	3
110	Transient Gratings Formed by Nonequilibrium Quasiparticles in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6.5</sub> . Journal of Superconductivity and Novel Magnetism, 2004, 17, 117-120.	0.5	2
111	Note: A cryogenic, ultra-high-vacuum, microwave filter which passes a narrow beam. Review of Scientific Instruments, 2015, 86, 126101.	1.3	2
112	Antiproton compression and radial measurements. AIP Conference Proceedings, 2008, , .	0.4	1
113	Antiparticle sources for antihydrogen production and trapping. Journal of Physics: Conference Series, 2011, 262, 012001.	0.4	1
114	Alternative method for reconstruction of antihydrogen annihilation vertices. Hyperfine Interactions, 2012, 212, 101-107.	0.5	1
115	Energy Scales in the High-Tc Superconductor YBa <sub>2</sub> Cu <sub>3</sub> O <sub>6+x</sub> . Journal of Superconductivity and Novel Magnetism, 2004, 17, 93-96.	0.5	0
116	Towards antihydrogen trapping and spectroscopy at ALPHA. Hyperfine Interactions, 2011, 199, 39-48.	0.5	0
117	Antihydrogen formation by autoresonant excitation of antiproton plasmas. Hyperfine Interactions, 2012, 212, 61-67.	0.5	0
118	Microwave-plasma interactions studied via mode diagnostics in ALPHA. Hyperfine Interactions, 2012, 212, 117-123.	0.5	0
119	Limit on the electric charge of antihydrogen. Hyperfine Interactions, 2017, 238, 1.	0.5	0