Frank H L Koppens

List of Publications by Year
in descending order

157 papers	30,998 citations	13865 67 h-index	13379 130 g-index
164 all docs	164 docs citations	164 times ranked	26022 citing authors

#	Article	IF	Citations
1	Photodetectors based on graphene, other two-dimensional materials and hybrid systems. Nature Nanotechnology, 2014, 9, 780-793.	31.5	3,017
2	Science and technology roadmap for graphene, related two-dimensional crystals, and hybrid systems. Nanoscale, 2015, 7, 4598-4810.	5.6	2,452
3	Graphene Plasmonics: A Platform for Strong Lightâ€“Matter Interactions. Nano Letters, 2011, 11, 3370-3377.	9.1	2,393
4	Hybrid grapheneâ€“quantum dot phototransistors with ultrahigh gain. Nature Nanotechnology, 2012, 7, 363-368.	31.5	1,936
5	Optical nano-imaging of gate-tunable graphene plasmons. Nature, 2012, 487, 77-81.	27.8	1,820
6	Driven coherent oscillations of a single electron spin in a quantum dot. Nature, 2006, 442, 766-771.	27.8	1,207
7	Complete Optical Absorption in Periodically Patterned Graphene. Physical Review Letters, 2012, 108, 047401.	7.8	1,087
8	Polaritons in layered two-dimensional materials. Nature Materials, 2017, 16, 182-194.	27.5	963
9	Graphene and two-dimensional materials for silicon technology. Nature, 2019, 573, 507-518.	27.8	936
10	Coherent Control of a Single Electron Spin with Electric Fields. Science, 2007, 318, 1430-1433.	12.6	860
11	Highly confined low-loss plasmons in grapheneâ€“boron nitride heterostructures. Nature Materials, 2015, 14, 421-425.	27.5	847
12	Graphene Plasmon Waveguiding and Hybridization in Individual and Paired Nanoribbons. ACS Nano, 2012, 6, 431-440.	14.6	646
13	Hybrid 2Dâ€“0D MoS₂â€“PbS Quantum Dot Photodetectors. Advanced Materials, 2015, 27, 176-180.	21.0	638
14	Broadband image sensor array based on grapheneâ€“CMOS integration. Nature Photonics, 2017, 11, 366-371.	31.4	523
15	Photoexcitation cascade and multiple hot-carrier generation in graphene. Nature Physics, 2013, 9, 248-252.	16.7	512
16	Picosecond photoresponse in van der Waals heterostructures. Nature Nanotechnology, 2016, 11, 42-46.	31.5	493
17	Control and Detection of Singlet-Triplet Mixing in a Random Nuclear Field. Science, 2005, 309, 1346-1350.	12.6	490
18	Gate-Activated Photoresponse in a Graphene pâ€“n Junction. Nano Letters, 2011, 11, 4134-4137.	9.1	379

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19	Plasmon-Induced Doping of Graphene. ACS Nano, 2012, 6, 10222-10228.	14.6	356
20	A quantum spin transducer based on nanoelectromechanical resonator arrays. Nature Physics, 2010, 6, 602-608.	16.7	346
21	Untying the insulating and superconducting orders in magic-angle graphene. Nature, 2020, 583, 375-378.	27.8	323
22	Controlling graphene plasmons with resonant metal antennas and spatial conductivity patterns. Science, 2014, 344, 1369-1373.	12.6	292
23	Near-field electrical detection of optical plasmons and single-plasmon sources. Nature Physics, 2009, 5, 475-479.	16.7	290
24	Graphene-based integrated photonics for next-generation datacom and telecom. Nature Reviews Materials, 2018, 3, 392-414.	48.7	286
25	Single-Shot Readout of Electron Spin States in a Quantum Dot Using Spin-Dependent Tunnel Rates. Physical Review Letters, 2005, 94, 196802.	7.8	281
26	Direct observation of ultraslow hyperbolic polariton propagation with negative phase velocity. Nature Photonics, 2015, 9, 674-678.	31.4	268
27	Probing the ultimate plasmon confinement limits with a van der Waals heterostructure. Science, 2018, 360, 291-295.	12.6	259
28	Acoustic terahertz graphene plasmons revealed by photocurrent nanoscopy. Nature Nanotechnology, 2017, 12, 31-35.	31.5	257
29	Tuning quantum nonlocal effects in graphene plasmonics. Science, 2017, 357, 187-191.	12.6	251
30	Integrating an electrically active colloidal quantum dot photodiode with a graphene phototransistor. Nature Communications, 2016, 7, 11954.	12.8	217
31	Generation of photovoltage in graphene on a femtosecond timescale through efficient carrier heating. Nature Nanotechnology, 2015, 10, 437-443.	31.5	210
32	Universal Distance-Scaling of Nonradiative Energy Transfer to Graphene. Nano Letters, 2013, 13, 2030-2035.	9.1	197
33	Flexible graphene photodetectors for wearable fitness monitoring. Science Advances, 2019, 5, eaaw7846.	10.3	186
34	High-Responsivity Grapheneâ€“Boron Nitride Photodetector and Autocorrelator in a Silicon Photonic Integrated Circuit. Nano Letters, 2015, 15, 7288-7293.	9.1	185
35	Spin Echo of a Single Electron Spin in a Quantum Dot. Physical Review Letters, 2008, 100, 236802.	7.8	179
36	Photo-thermionic effect in vertical graphene heterostructures. Nature Communications, 2016, 7, 12174.	12.8	179

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37	Single-Photon Nonlinear Optics with Graphene Plasmons. Physical Review Letters, 2013, 111, 247401.	7.8	172
38	Real-space mapping of tailored sheet and edge plasmons in graphene nanoresonators. Nature Photonics, 2016, 10, 239-243.	31.4	167
39	Graphene-based mid-infrared room-temperature pyroelectric bolometers with ultrahigh temperature coefficient of resistance. Nature Communications, 2017, 8, 14311.	12.8	151
40	Fast and Sensitive Terahertz Detection Using an Antenna-Integrated Graphene pn Junction. Nano Letters, 2019, 19, 2765-2773.	9.1	144
41	Thermoelectric detection and imaging of propagating grapheneÂplasmons. Nature Materials, 2017, 16, 204-207.	27.5	141
42	High-Mobility, Wet-Transferred Graphene Grown by Chemical Vapor Deposition. ACS Nano, 2019, 13, 8926-8935.	14.6	132
43	Out-of-plane heat transfer in van der Waals stacks through electronâ€“hyperbolic phonon coupling. Nature Nanotechnology, 2018, 13, 41-46.	31.5	128
44	Three-dimensional optical manipulation of a single electron spin. Nature Nanotechnology, 2013, 8, 175-179.	31.5	127
45	Tuning ultrafast electron thermalization pathways in a van der Waals heterostructure. Nature Physics, 2016, 12, 455-459.	16.7	127
46	Locking electron spins into magnetic resonance by electronâ€“nuclear feedback. Nature Physics, 2009, 5, 764-768.	16.7	125
47	Interface Engineering in Hybrid Quantum Dotâ€“2D Phototransistors. ACS Photonics, 2016, 3, 1324-1330.	6.6	122
48	Strong Plasmon Reflection at Nanometer-Size Gaps in Monolayer Graphene on SiC. Nano Letters, 2013, 13, 6210-6215.	9.1	121
49	High Quality Factor Mechanical Resonators Based on WSe₂ Monolayers. Nano Letters, 2016, 16, 5102-5108.	9.1	117
50	Dissociation of two-dimensional excitons in monolayer WSe2. Nature Communications, 2018, 9, 1633.	12.8	116
51	Far-field excitation of single graphene plasmon cavities with ultracompressed mode volumes. Science, 2020, 368, 1219-1223.	12.6	114
52	Experimental Signature of Phonon-Mediated Spin Relaxation in a Two-Electron Quantum Dot. Physical Review Letters, 2007, 98, 126601.	7.8	112
53	Ultrafast nonlinear optical response of Dirac fermions in graphene. Nature Communications, 2018, 9, 1018.	12.8	110
54	Electrical control of optical emitter relaxation pathways enabled by graphene. Nature Physics, 2015, 11, 281-287.	16.7	99

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55	Competing Ultrafast Energy Relaxation Pathways in Photoexcited Graphene. Nano Letters, 2014, 14, 5839-5845.	9.1	97
56	The ultrafast dynamics and conductivity of photoexcited graphene at different Fermi energies. Science Advances, 2018, 4, eaar5313.	10.3	95
57	Universal Phase Shift and Nonexponential Decay of Driven Single-Spin Oscillations. Physical Review Letters, 2007, 99, 106803.	7.8	84
58	Terahertz Nanofocusing with Cantilevered Terahertz-Resonant Antenna Tips. Nano Letters, 2017, 17, 6526-6533.	9.1	84
59	Plasmon losses due to electron-phonon scattering: The case of graphene encapsulated in hexagonal boron nitride. Physical Review B, 2014, 90, .	3.2	83
60	Quantum Nanophotonics in Two-Dimensional Materials. ACS Photonics, 2021, 8, 85-101.	6.6	83
61	Near-field photocurrent nanoscopy on bare and encapsulated graphene. Nature Communications, 2016, 7, 10783.	12.8	80
62	Photoexcited carrier dynamics and impact-excitation cascade in graphene. Physical Review B, 2013, 87, .	3.2	79
63	Single organic molecules for photonic quantum technologies. Nature Materials, 2021, 20, 1615-1628.	27.5	79
64	Nano-imaging of intersubband transitions in van der Waals quantum wells. Nature Nanotechnology, 2018, 13, 1035-1041.	31.5	75
65	<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mi>I</mml:mi><mml:mi>n</mml:mi><mml:mi>S</mml:mi><mml:mi>i</mml:mi><mml:mi>t</mml:mi><mml:m of Charge Noise in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mi>GaAs</mml:mi><mml:mo>/</mml:mo><mml:msub><mml:mi>Al</mml:mi><mml:mi>x</mml:mi></mml:ms Physical Review Letters, 2008, 101, 226603.	7.8	73
66	Hot-carrier photocurrent effects at grapheneâ€“metal interfaces. Journal of Physics Condensed Matter, 2015, 27, 164207.	1.8	71
67	Ultrafast electronic readout of diamond nitrogenâ€“vacancy centres coupled to graphene. Nature Nanotechnology, 2015, 10, 135-139.	31.5	70
68	Grating-Graphene Metamaterial as a Platform for Terahertz Nonlinear Photonics. ACS Nano, 2021, 15, 1145-1154.	14.6	69
69	Extraordinary linear dynamic range in laser-defined functionalized graphene photodetectors. Science Advances, 2017, 3, e1602617.	10.3	67
70	Phonon-Mediated Mid-Infrared Photoresponse of Graphene. Nano Letters, 2014, 14, 6374-6381.	9.1	64
71	Electrical 2Ï€ phase control of infrared light in a 350-nm footprint using graphene plasmons. Nature Photonics, 2017, 11, 421-424.	31.4	63
72	Electromechanical control of nitrogen-vacancy defect emission using graphene NEMS. Nature Communications, 2016, 7, 10218.	12.8	56

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73	Spatiotemporal imaging of 2D polariton wave packet dynamics using free electrons. Science, 2021, 372, 1181-1186.	12.6	56
74	Plasmonic antenna coupling to hyperbolic phonon-polaritons for sensitive and fast mid-infrared photodetection with graphene. Nature Communications, 2020, 11, 4872.	12.8	53
75	Electrical tunability of terahertz nonlinearity in graphene. Science Advances, 2021, 7, .	10.3	52
76	Ultrafast, Zero-Bias, Graphene Photodetectors with Polymeric Gate Dielectric on Passive Photonic Waveguides. ACS Nano, 2020, 14, 11190-11204.	14.6	48
77	Tunable free-electron X-ray radiation from van der Waals materials. Nature Photonics, 2020, 14, 686-692.	31.4	48
78	Near-Unity Light Absorption in a Monolayer WS₂ Van der Waals Heterostructure Cavity. Nano Letters, 2020, 20, 3545-3552.	9.1	48
79	Dispersive soft x-ray absorption fine-structure spectroscopy in graphite with an attosecond pulse. Optica, 2018, 5, 502.	9.3	47
80	Giant enhancement of third-harmonic generation in grapheneâ€“metal heterostructures. Nature Nanotechnology, 2021, 16, 318-324.	31.5	47
81	Observation of interband collective excitations in twisted bilayer graphene. Nature Physics, 2021, 17, 1162-1168.	16.7	47
82	Probing nonlocal effects in metals with graphene plasmons. Physical Review B, 2018, 97, .	3.2	44
83	Hot-Carrier Cooling in High-Quality Graphene Is Intrinsically Limited by Optical Phonons. ACS Nano, 2021, 15, 11285-11295.	14.6	43
84	Intrinsic Plasmonâ€“Phonon Interactions in Highly Doped Graphene: AÂNear-Field Imaging Study. Nano Letters, 2017, 17, 5908-5913.	9.1	42
85	Nondestructive measurement of electron spins in a quantum dot. Physical Review B, 2006, 74, .	3.2	41
86	Harnessing Vacuum Forces for Quantum Sensing of Graphene Motion. Physical Review Letters, 2014, 112, 223601.	7.8	41
87	2D-3D integration of hexagonal boron nitride and a high-Î² dielectric for ultrafast graphene-based electro-absorption modulators. Nature Communications, 2021, 12, 1070.	12.8	40
88	Detection of single electron spin resonance in a double quantum dot. Journal of Applied Physics, 2007, 101, 081706.	2.5	39
89	Multiple Nuclear Polarization States in a Double Quantum Dot. Physical Review Letters, 2009, 103, 046601.	7.8	39
90	Grapheneâ€“Quantum Dot Hybrid Photodetectors with Low Dark-Current Readout. ACS Nano, 2020, 14, 11897-11905.	14.6	39

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91	Super-Planckian Electron Cooling in a van der Waals Stack. Physical Review Letters, 2017, 118, 126804.	7.8	38
92	Optical and plasmonic properties of twisted bilayer graphene: Impact of interlayer tunneling asymmetry and ground-state charge inhomogeneity. Physical Review B, 2020, 102, .	3.2	33
93	Ultrathin Eu- and Er-Doped Y₂O₃ Films with Optimized Optical Properties for Quantum Technologies. Journal of Physical Chemistry C, 2019, 123, 13354-13364.	3.1	32
94	Highly confined in-plane propagating exciton-polaritons on monolayer semiconductors. 2D Materials, 2020, 7, 035031.	4.4	32
95	Nuclear spin dynamics in double quantum dots: Fixed points, transients, and intermittency. Physical Review B, 2011, 84, .	3.2	30
96	Midâ€Infrared Pyroresistive Graphene Detector on LiNbO₃. Advanced Optical Materials, 2017, 5, 1600723.	7.3	30
97	Electrical Control of Lifetime-Limited Quantum Emitters Using 2D Materials. Nano Letters, 2019, 19, 3789-3795.	9.1	30
98	Nano-imaging photoresponse in a moirÃ© unit cell of minimally twisted bilayer graphene. Nature Communications, 2021, 12, 1640.	12.8	29
99	Spin filling of a quantum dot derived from excited-state spectroscopy. New Journal of Physics, 2005, 7, 182-182.	2.9	27
100	Quantum surface-response of metals revealed by acoustic graphene plasmons. Nature Communications, 2021, 12, 3271.	12.8	27
101	Tunable and giant valley-selective Hall effect in gapped bilayer graphene. Science, 2022, 375, 1398-1402.	12.6	26
102	Electrical detection of hyperbolic phonon-polaritons in heterostructures of graphene and boron nitride. Npj 2D Materials and Applications, 2017, 1, .	7.9	25
103	Single-molecule study for a graphene-based nano-position sensor. New Journal of Physics, 2014, 16, 113007.	2.9	23
104	Chip-Scalable, Room-Temperature, Zero-Bias, Graphene-Based Terahertz Detectors with Nanosecond Response Time. ACS Nano, 2021, 15, 17966-17976.	14.6	21
105	Growth of Ultraflat Graphene with Greatly Enhanced Mechanical Properties. Nano Letters, 2020, 20, 6798-6806.	9.1	19
106	Fast electrical modulation of strong near-field interactions between erbium emitters and graphene. Nature Communications, 2020, 11, 4094.	12.8	18
107	Coherent characterisation of a single molecule in a photonic black box. Nature Communications, 2021, 12, 706.	12.8	18
108	Tuning of impurity-bound interlayer complexes in a van der Waals heterobilayer. 2D Materials, 2019, 6, 035032.	4.4	17

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109	The Rise of Twist-Optics. Nano Letters, 2020, 20, 6935-6936.	9.1	17
110	Kinetic Ionic Permeation and Interfacial Doping of Supported Graphene. Nano Letters, 2019, 19, 9029-9036.	9.1	16
111	Observation of giant and tunable thermal diffusivity of a Dirac fluid at room temperature. Nature Nanotechnology, 2021, 16, 1195-1200.	31.5	16
112	Plasmons in moirÃ© superlattices. Nature Materials, 2015, 14, 1187-1188.	27.5	15
113	Understanding the Electromagnetic Response of Graphene/Metallic Nanostructures Hybrids of Different Dimensionality. ACS Photonics, 2020, 7, 2302-2308.	6.6	15
114	Topological Graphene Plasmons in a Plasmonic Realization of the Suâ€“Schriefferâ€“Heeger Model. ACS Photonics, 2021, 8, 1817-1823.	6.6	15
115	Propagating Plasmons in a Charge-Neutral Quantum Tunneling Transistor. ACS Photonics, 2017, 4, 3012-3017.	6.6	14
116	Acoustic plasmons at the crossover between the collisionless and hydrodynamic regimes in two-dimensional electron liquids. Physical Review B, 2019, 99, .	3.2	14
117	Combining density functional theory with macroscopic QED for quantum light-matter interactions in 2D materials. Nature Communications, 2021, 12, 2778.	12.8	14
118	Harnessing ultraconfined graphene plasmons to probe the electrodynamics of superconductors. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	7.1	10
119	High fidelity measurement of singletâ€“triplet state in a quantum dot. Physica Status Solidi (B): Basic Research, 2006, 243, 3855-3858.	1.5	9
120	Narrow Line Width Quantum Emitters in an Electron-Beam-Shaped Polymer. ACS Photonics, 2019, 6, 3120-3125.	6.6	9
121	Single-shot readout of electron spins in a semiconductor quantum dot. Physica E: Low-Dimensional Systems and Nanostructures, 2006, 34, 1-5.	2.7	7
122	Introduction to the issue on graphene optoelectronics. IEEE Journal of Selected Topics in Quantum Electronics, 2014, 20, 6-8.	2.9	7
123	Highâ€Harmonic Generation Enhancement with Graphene Heterostructures. Advanced Optical Materials, 2022, 10, .	7.3	6
124	Compact mid-infrared graphene thermopile enabled by a nanopatterning technique of electrolyte gates. New Journal of Physics, 2018, 20, 083050.	2.9	5
125	Three-spin juggling. Nature Physics, 2012, 8, 5-6.	16.7	4
126	Unbiased Plasmonic-Assisted Integrated Graphene Photodetectors. ACS Photonics, 2022, 9, 1992-2007.	6.6	4

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127	Highly sensitive, ultrafast photo-thermoelectric graphene THz detector. , 2018, , .		3
128	Graphene Plasmonics. , 2011, , .		2
129	Pulse measurement from near to mid-IR using third harmonic generation dispersion scan in multilayer graphene. , 2013, , .		2
130	Imaging vibrations of electromechanical few layer graphene resonators with a moving vacuum enclosure. Precision Engineering, 2021, 72, 769-776.	3.4	2
131	Dual-gated graphene with ion gel gates as mid-infrared photodetectors. , 2016, , .		1
132	Graphene Plasmonics. , 2017, , 104-140.		1
133	Electromechanical control of nitrogen-vacancy defect emission using graphene NEMS. , 0, .		1
134	3D Optical Manipulation of a Single Electron Spin. , 2013, , .		1
135	Ultrafast carrier dynamics in graphene and graphene nanostructures. Terahertz Science & Technology, 2020, 13, 135-148.	0.5	1
136	Single-Shot Readout of Electron Spins in a Semiconductor Quantum Dot. AIP Conference Proceedings, 2006, , .	0.4	0
137	Quantum optics with nanoscale surface plasmons. , 2009, , .		0
138	Photoexcitation cascade and multiple hot carrier generation in graphene. , 2013, , .		0
139	Hot carrier multiplication in graphene. , 2013, , .		0
140	Terahertz Carrier Dynamics in Graphene and Graphene Nanostructures. , 2014, , .		0
141	Inherent Resistivity of Graphene to Strong THz Fields. , 2014, , .		0
142	Nonlinear THz conductivity in graphene. , 2014, , .		0
143	Graphene opto-electronics and plasmonics for infrared frequencies. , 2015, , .		0
144	2D-3D integration of high-Î¹ dielectric with 2D heterostructures for opto-electronic applications. , 2019, , .		0

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145	Highly-confined Exciton-polaritons in Monolayer Semiconductors. , 2021, , .		0
146	Hot plasmons make graphene shine. Nature Materials, 2021, 20, 721-722.	27.5	0
147	Towards plasmonic-enhanced optical nonlinearities in graphene metal-heterostructures. , 2021, , .		0
148	Quantum Surface-Response of Metals Probed by Graphene Plasmons. , 2021, , .		0
149	Graphene light-matter interactions. , 2013, , .		0
150	Near to mid-IR ultra-broadband third harmonic generation in multilayer graphene: few-cycle pulse measurement using THG dispersion-scan. , 2013, , .		0
151	Control of Energy Relaxation Pathways in Graphene: Carrier-Carrier Scattering vs Phonon Emission. , 2015, , .		0
152	Self-Aligned Local Electrolyte Gating of 2D Materials for Mid-Infrared Photodetection. , 2017, , .		0
153	The Ultimate Purcell Factor in Van der Waals Heterostructures. , 2019, , .		0
154	Huge plasmon-enhanced Third Harmonic Generation with graphene nanoribbons. , 2019, , .		0
155	Extreme Mid-IR Light Trapping with Graphene Plasmons. Optics and Photonics News, 2020, 31, 40.	0.5	0
156	Giant enhancement of high-harmonic generation in graphene-metal heterostructures. , 2020, , .		0
157	High-momentum 2D Exciton-polaritons in Monolayer Semiconductors. , 2021, , .		0