Gengchiau Liang

List of Publications by Year
in descending order

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150 papers	4,369 citations	109137 35 h-index	118652 62 g-index
152 all docs	152 docs citations	152 times ranked	5164 citing authors

#	Article	IF	Citations
1	Performance Projections for Ballistic Graphene Nanoribbon Field-Effect Transistors. IEEE Transactions on Electron Devices, 2007, 54, 677-682.	1.6	233
2	Thermoelectric performance of MX2 (Mâ€‰=â€‰Mo,W; Xâ€‰=â€‰S,Se) monolayers. Journal of Applied Physics, 2013, 113, .	1.1	202
3	Silicon-based Molecular Electronics. Nano Letters, 2004, 4, 1803-1807.	4.5	196
4	Graphene-based Spin Caloritronics. Nano Letters, 2011, 11, 1369-1373.	4.5	183
5	All-electric magnetization switching and Dzyaloshinskiiâ€“Moriya interaction in WTe2/ferromagnet heterostructures. Nature Nanotechnology, 2019, 14, 945-949.	15.6	177
6	Theoretical study of thermoelectric properties of few-layer MoS2 and WSe2. Physical Chemistry Chemical Physics, 2014, 16, 10866.	1.3	174
7	Performance Analysis of a Ge/Si Core/Shell Nanowire Field-Effect Transistor. Nano Letters, 2007, 7, 642-646.	4.5	157
8	Sub-100 Nanometer Channel Length Ge/Si Nanowire Transistors with Potential for 2 THz Switching Speed. Nano Letters, 2008, 8, 925-930.	4.5	150
9	Ultrafast and energy-efficient spinâ€“orbit torque switching in compensated ferrimagnets. Nature Electronics, 2020, 3, 37-42.	13.1	147
10	High oscillator strength interlayer excitons in two-dimensional heterostructures for mid-infrared photodetection. Nature Nanotechnology, 2020, 15, 675-682.	15.6	129
11	Disorder enhances thermoelectric figure of merit in armchair graphane nanoribbons. Applied Physics Letters, 2009, 95, .	1.5	128
12	Ballistic graphene nanoribbon metal-oxide-semiconductor field-effect transistors: A full real-space quantum transport simulation. Journal of Applied Physics, 2007, 102, .	1.1	124
13	Single Atomically Sharp Lateral Monolayer pâ€n Heterojunction Solar Cells with Extraordinarily High Power Conversion Efficiency. Advanced Materials, 2017, 29, 1701168.	11.1	111
14	Electrostatic potential profiles of molecular conductors. Physical Review B, 2004, 69, .	1.1	104
15	Room-temperature nonlinear Hall effect and wireless radiofrequency rectification in Weyl semimetal TaIrTe4. Nature Nanotechnology, 2021, 16, 421-425.	15.6	91
16	Contact Effects in Graphene Nanoribbon Transistors. Nano Letters, 2008, 8, 1819-1824.	4.5	68
17	An ab initio study on energy gap of bilayer graphene nanoribbons with armchair edges. Applied Physics Letters, 2008, 92, .	1.5	64
18	Spin-dependent thermoelectric effects in graphene-based spin valves. Nanoscale, 2013, 5, 200-208.	2.8	64

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19	Theoretical study on thermoelectric properties of kinked graphene nanoribbons. Physical Review B, 2011, 84, .	1.1	62
20	Molecules on silicon: Self-consistent first-principles theory and calibration to experiments. Physical Review B, 2005, 72, .	1.1	59
21	Suppression of dark current in germanium-tin on silicon p-i-n photodiode by a silicon surface passivation technique. Optics Express, 2015, 23, 18611.	1.7	59
22	Shape effects in graphene nanoribbon resonant tunneling diodes: A computational study. Journal of Applied Physics, 2009, 105, .	1.1	57
23	A Simulation Study of Graphene-Nanoribbon Tunneling FET With Heterojunction Channel. IEEE Electron Device Letters, 2010, 31, 555-557.	2.2	57
24	Exploring Low Power and Ultrafast Memristor on p-Type van der Waals SnS. Nano Letters, 2021, 21, 8800-8807.	4.5	57
25	Bilayer graphene nanoribbon nanoelectromechanical system device: A computational study. Applied Physics Letters, 2009, 95, .	1.5	54
26	Ballistic Transport Performance of Silicane and Germanane Transistors. IEEE Transactions on Electron Devices, 2014, 61, 1590-1598.	1.6	51
27	Klein tunneling in Weyl semimetals under the influence of magnetic field. Scientific Reports, 2016, 6, 38862.	1.6	51
28	Device Physics and Characteristics of Graphene Nanoribbon Tunneling FETs. IEEE Transactions on Electron Devices, 2010, 57, 3144-3152.	1.6	49
29	Germanium-Tin on Si Avalanche Photodiode: Device Design and Technology Demonstration. IEEE Transactions on Electron Devices, 2015, 62, 128-135.	1.6	48
30	Extended HÃ¼ckel theory for band structure, chemistry, and transport. II. Silicon. Journal of Applied Physics, 2006, 100, 043715.	1.1	47
31	Stability and electronic structure of two dimensional Cx(BN)y compound. Applied Physics Letters, 2011, 98, .	1.5	45
32	Floating-base germanium-tin heterojunction phototransistor for high-efficiency photodetection in short-wave infrared range. Optics Express, 2017, 25, 18502.	1.7	44
33	Photoacoustic Trace Detection of Methane Using Compact Solid-State Lasersâ€. Journal of Physical Chemistry A, 2000, 104, 10179-10183.	1.1	42
34	Geometry effects on thermoelectric properties of silicon nanowires based on electronic band structures. Journal of Applied Physics, 2010, 107, 014317.	1.1	41
35	Photoacoustic measurement of methane concentrations with a compact pulsed optical parametric oscillator. Applied Optics, 2002, 41, 2985.	2.1	36
36	Enhanced Faraday rotation in magnetophotonic crystal infiltrated with graphene. Applied Physics Letters, 2011, 98, .	1.5	36

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37	Ge0.83Sn0.17 p-channel metal-oxide-semiconductor field-effect transistors: Impact of sulfur passivation on gate stack quality. Journal of Applied Physics, 2016, 119, .	1.1	34
38	Efficient dual spin-valley filter in strained silicene. Applied Physics Express, 2015, 8, 105201.	1.1	31
39	Ambipolar bistable switching effect of graphene. Applied Physics Letters, 2010, 97, .	1.5	30
40	Perfect valley filter in strained graphene with single barrier region. AIP Advances, 2016, 6, .	0.6	28
41	Magnetoresistive effect in graphene nanoribbon due to magnetic field induced band gap modulation. Journal of Applied Physics, 2010, 108, .	1.1	26
42	Identifying Contact Effects in Electronic Conduction throughC60on Silicon. Physical Review Letters, 2005, 95, 076403.	2.9	25
43	Improved carrier injection in gate-all-around Schottky barrier silicon nanowire field-effect transistors. Applied Physics Letters, 2008, 93, 073503.	1.5	25
44	Germanium-tin multiple quantum well on silicon avalanche photodiode for photodetection at two micron wavelength. Semiconductor Science and Technology, 2016, 31, 095001.	1.0	25
45	Electrically tunable valley polarization in Weyl semimetals with tilted energy dispersion. Scientific Reports, 2019, 9, 4480.	1.6	25
46	Transition-Metal-Atom-Embedded Graphane and Its Spintronic Device Applications. Journal of Physical Chemistry C, 2011, 115, 22701-22706.	1.5	24
47	Ultra-low specific contact resistivity (1.4â€‰Ã—â€‰10â^'9 Î©·cm2) for metal contacts on in-situ Ga-doped Ge0.95Sn0.05 film. Journal of Applied Physics, 2017, 122, .	1.1	23
48	Observation of the Outâ€ofâ€Plane Polarized Spin Current from CVD Grown WTe₂. Advanced Quantum Technologies, 2021, 4, 2100038.	1.8	23
49	Computational study of double-gate graphene nano-ribbon transistors. Journal of Computational Electronics, 2008, 7, 394-397.	1.3	22
50	Ge_{0.95}Sn_{0.05} Gate-All-Around p-Channel Metal-Oxide-Semiconductor Field-Effect Transistors with Sub-3 nm Nanowire Width. Nano Letters, 2021, 21, 5555-5563.	4.5	21
51	Role of carrier-transfer in the optical nonlinearity of graphene/Bi₂Te₃ heterojunctions. Nanoscale, 2020, 12, 16956-16966.	2.8	20
52	Voltage-Controlled Spintronic Stochastic Neuron for Restricted Boltzmann Machine With Weight Sparsity. IEEE Electron Device Letters, 2020, 41, 1102-1105.	2.2	18
53	A Physics-Based Compact Model for Transition-Metal Dichalcogenides Transistors With the Band-Tail Effect. IEEE Electron Device Letters, 2018, 39, 761-764.	2.2	17
54	Influence of Size and Shape on the Performance of VCMA-Based MTJs. IEEE Transactions on Electron Devices, 2019, 66, 944-949.	1.6	17

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55	Temperature Dependence of Carrier Transport of a Silicon Nanowire Schottky-Barrier Field-Effect Transistor. IEEE Nanotechnology Magazine, 2008, 7, 728-732.	1.1	16
56	Evaluation of mobility in thin Bi2Se3 Topological Insulator for prospects of Local Electrical Interconnects. Scientific Reports, 2014, 4, 6838.	1.6	16
57	Thermally induced currents in graphene-based heterostructure. Applied Physics Letters, 2011, 99, .	1.5	15
58	Quantum transport simulations of graphene nanoribbon devices using Dirac equation calibrated with tight-binding Ï€-bond model. Nanoscale Research Letters, 2012, 7, 114.	3.1	15
59	Ultimate Performance Projection of Ultrathin Body Transistor Based on Group IV, III-V, and 2-D-Materials. IEEE Transactions on Electron Devices, 2016, 63, 773-780.	1.6	15
60	Conductance modulation in Weyl semimetals with tilted energy dispersion without a band gap. Journal of Applied Physics, 2017, 121, 244303.	1.1	15
61	Tunneling characteristics of graphene. Applied Physics Letters, 2010, 97, 252102.	1.5	13
62	Role of acoustic phonons in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mi>Bi</mml:mi><mml:mn>2</mml:mn></mml:msub><mml:m insulator slabs: A quantum transport investigation. Physical Review B, 2014, 89, .	1.1	13
63	A Computational Study on the Device Performance of Graphene Nanoribbon Resonant Tunneling Diodes. Japanese Journal of Applied Physics, 2009, 48, 04C156.	0.8	12
64	Gate-All-Around In_{0.53}Ga_{0.47}As Junctionless Nanowire FET With Tapered Source/Drain Structure. IEEE Transactions on Electron Devices, 2016, 63, 1027-1033.	1.6	12
65	Field-Free Switching of Perpendicular Magnetization Through Spin Hall and Anomalous Hall Effects in Ferromagnetâ€“Heavy-Metalâ€“Ferromagnet Structures. Physical Review Applied, 2019, 12, .	1.5	12
66	Spin tunneling in multilayer spintronic devices. Physical Review B, 2008, 77, .	1.1	11
67	Theoretical Study on Thermoelectric Properties of Ge Nanowires Based on Electronic Band Structures. IEEE Electron Device Letters, 2010, 31, 1026-1028.	2.2	11
68	Electrostatics of Ultimately Thin-Body Tunneling FET Using Graphene Nanoribbon. IEEE Electron Device Letters, 2011, 32, 431-433.	2.2	11
69	Y-shape spin-separator for two-dimensional group-IV nanoribbons based on quantum spin hall effect. Applied Physics Letters, 2014, 104, 032410.	1.5	11
70	Anomalous tunneling characteristic of Weyl semimetals with tilted energy dispersion. Applied Physics Letters, 2017, 111, 063101.	1.5	11
71	Ultrafast and low-energy switching in voltage-controlled elliptical pMTJ. Scientific Reports, 2017, 7, 16562.	1.6	11
72	Time-dependent quantum transport and power-law decay of the transient current in a nano-relay and nano-oscillator. Journal of Applied Physics, 2011, 110, .	1.1	10

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73	Spin filtering and spin separating effects in U-shaped topological insulator devices. Journal of Applied Physics, 2012, 112, 073707.	1.1	10
74	Performance evaluation of electro-optic effect based graphene transistors. Nanoscale, 2012, 4, 6365.	2.8	10
75	Effect of Body Thickness on the Electrical Performance of Ballistic n-Channel GaSb Double-Gate Ultrathin-Body Transistor. IEEE Transactions on Electron Devices, 2015, 62, 788-794.	1.6	10
76	A unified surface potential based physical compact model for both unipolar and ambipolar 2D-FET: Experimental verification and circuit demonstration. , 2017, , .		10
77	Analysis on Performance of Ferroelectric NC-FETs Based on Real-Space Gibbs-Free Energy With Atomic Channel Structure. IEEE Transactions on Electron Devices, 2019, 66, 1100-1106.	1.6	10
78	Influence of edge roughness on graphene nanoribbon resonant tunnelling diodes. Journal Physics D: Applied Physics, 2010, 43, 215101.	1.3	9
79	The effect of magnetic field and disorders on the electronic transport in graphene nanoribbons. Journal of Physics Condensed Matter, 2010, 22, 375303.	0.7	9
80	High magnetoresistance at room temperature in p-i-n graphene nanoribbons due to band-to-band tunneling effects. Applied Physics Letters, 2011, 99, .	1.5	9
81	The effects of interlayer mismatch on electronic properties of bilayer armchair graphene nanoribbons. Carbon, 2012, 50, 1659-1666.	5.4	9
82	Nanoscale FETs Simulation Based on Full-Complex-Band Structure and Self-Consistently Solved Atomic Potential. IEEE Transactions on Electron Devices, 2017, 64, 58-65.	1.6	9
83	Shape Effects on the Performance of Si and Ge Nanowire Field-Effect Transistors Based on Size Dependent Bandstructure. Japanese Journal of Applied Physics, 2010, 49, 04DN07.	0.8	8
84	Monolithic Integration of InAs Quantum-Well n-MOSFETs and Ultrathin Body Ge p-MOSFETs on a Si Substrate. IEEE Transactions on Electron Devices, 2017, 64, 353-360.	1.6	8
85	Theoretical proposal for determining angular momentum compensation in ferrimagnets. Physical Review B, 2018, 97, .	1.1	8
86	Electrical Generation and Detection of Terahertz Signal Based on Spin-Wave Emission From Ferrimagnets. Physical Review Applied, 2020, 13, .	1.5	8
87	Time-Dependent Landau-Ginzburg Equation-Based Ferroelectric Tunnel Junction Modeling With Dynamic Response and Multi-Domain Characteristics. IEEE Electron Device Letters, 2022, 43, 158-161.	2.2	8
88	Graphene Nanoribbon Tunneling Field-Effect Transistors With a Semiconducting and a Semimetallic Heterojunction Channel. IEEE Transactions on Electron Devices, 2012, 59, 1454-1461.	1.6	7
89	Impact of Structure Relaxation on the Ultimate Performance of a Small Diameter, n-Type $langle 110 angle$ Si-Nanowire MOSFET. IEEE Nanotechnology Magazine, 2007, 6, 225-229.	1.1	6
90	Effect of Ribbon Width and Doping Concentration on Device Performance of Graphene Nanoribbon Tunneling Field-Effect Transistors. Japanese Journal of Applied Physics, 2010, 49, 04DJ10.	0.8	6

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91	Influence of contact doping on graphene nanoribbon heterojunction tunneling field effect transistors. Solid-State Electronics, 2012, 77, 51-55.	0.8	6
92	Effect of Band-Alignment Operation on Carrier Transport in Bi2Se3 Topological Insulator. Scientific Reports, 2014, 4, 6220.	1.6	6
93	Integration of InGaAs MOSFETs and GaAs/ AlGaAs lasers on Si Substrate for advanced opto-electronic integrated circuits (OEICs). Optics Express, 2017, 25, 31853.	1.7	6
94	A surface potential based compact model for two-dimensional field effect transistors with disorders induced transition behaviors. Journal of Applied Physics, 2018, 124, .	1.1	6
95	Width Effects in ballistic graphene nanoribbon FETs. , 2008, , .		5
96	Electrical transport of bottom-up grown single-crystal Si_{1âˆ’x}Ge_xnanowire. Nanotechnology, 2008, 19, 225203.	1.3	5
97	Conductance modulation in graphene nanoribbon under transverse asymmetric electric potential. Journal of Applied Physics, 2011, 109, 073704.	1.1	5
98	Effect of phase transition on quantum transport in group-IV two-dimensional U-shape device. Journal of Applied Physics, 2014, 116, .	1.1	5
99	Effects of interlayer interaction in van der Waals layered black phosphorus for sub-10 nm FET. , 2015, , .		5
100	Effects of Contact Placement and Intra/Interlayer Interaction in Current Distribution of Black Phosphorus Sub-10-nm FET. IEEE Transactions on Electron Devices, 2017, 64, 579-586.	1.6	5
101	Damping-like spin-orbit-torque-induced magnetization dynamics in ferrimagnets based on Landau-Lifshitz-Bloch equation. Journal of Applied Physics, 2018, 124, .	1.1	5
102	Percolation theory based statistical resistance model for resistive random access memory. Applied Physics Letters, 2018, 112, .	1.5	5
103	Electric-field-induced three-terminal pMTJ switching in the absence of an external magnetic field. Applied Physics Letters, 2018, 112, .	1.5	5
104	Voltage-input spintronic oscillator based on competing effect for extended oscillation regions. Journal of Applied Physics, 2019, 125, .	1.1	5
105	Spin-wave mediated interactions for majority computation using Skyrmions and spin-torque nano-oscillators. Journal of Magnetism and Magnetic Materials, 2019, 486, 165271.	1.0	5
106	Performance Evaluation and Device Physics Investigation of Negative-Capacitance MOSFETs Based on Ultrathin Body Silicon and Monolayer MoS₂. IEEE Transactions on Electron Devices, 2020, 67, 3049-3055.	1.6	5
107	Reply to: Detectivities of WS2/HfS2 heterojunctions. Nature Nanotechnology, 2022, 17, 220-221.	15.6	5
108	Etching of germanium-tin using ammonia peroxide mixture. Journal of Applied Physics, 2015, 118, .	1.1	4

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109	Growth and characterization of highly tensile strained Ge1â^'xSnx formed on relaxed InyGa1â^'yP buffer layers. Journal of Applied Physics, 2016, 119, .	1.1	4
110	Effects of scalability and floating metal on NC-FETs based on a real-space atomic model. Semiconductor Science and Technology, 2018, 33, 08LT01.	1.0	4
111	A Compact Model for 2-D Poly-MoS₂ FETs With Resistive Switching in Postsynaptic Simulation. IEEE Transactions on Electron Devices, 2019, 66, 4092-4100.	1.6	4
112	High and tunable spin current induced by magneticâ€“electric fields in a single-mode spintronic device. Nanotechnology, 2009, 20, 365204.	1.3	3
113	Device Performance of Graphene Nanoribbon Field Effect Transistors with Edge Roughness Effects: A Computational Study. , 2009, , .		3
114	Computational Study on the Performance Comparison of Monolayer and Bilayer Zigzag Graphene Nanoribbon FETs. , 2009, , .		3
115	A computational evaluation of the designs of a novel nanoelectromechanical switch based on bilayer graphene nanoribbon. , 2009, , .		3
116	Avalanche photodiode featuring Germanium-tin multiple quantum wells on silicon: Extending photodetection to wavelengths of 2 and beyond. , 2015, , .		3
117	Germanium-Tin heterojunction phototransistor: Towards high-efficiency low-power photodetection in short-wave infrared range. , 2016, , .		3
118	Record low specific contact resistivity (1.2Ã—10^{â^'9} Î©-cm²) for P-type semiconductors: Incorporation of Sn into Ge and in-Situ Ga doping. , 2017, , .		3
119	Inherent orbital spin textures in Rashba effect and their implications in spinâ€“orbitronics. Journal of Physics Condensed Matter, 2018, 30, 285502.	0.7	3
120	A statistical Seebeck coefficient model based on percolation theory in two-dimensional disordered systems. Journal of Applied Physics, 2019, 125, .	1.1	3
121	An Ab Initio Investigation of Energy Bandgap of Monolayer and Bilayer Graphene Nanoribbon Based on Different Basis Sets. , 2008, , .		2
122	Design evaluation of graphene nanoribbon nanoelectromechanical devices. Journal of Applied Physics, 2011, 110, 024302.	1.1	2
123	Ultimate performance projection of ballistic III-V ultra-thin-body MOSFET. , 2013, , .		2
124	Contact Effects in thin 3D-Topological Insulators: How does the current flow?. Scientific Reports, 2015, 5, 9479.	1.6	2
125	Performance evaluation of ferroelectric MOSFETs based on Gibbs free energy. , 2017, , .		2
126	Enabling low power and high speed OEICs: First monolithic integration of InGaAs n-FETs and lasers on Si substrate. , 2017, , .		2

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127	FANTASI: A novel devices-to-circuits simulation framework for fast estimation of write error rates in spintronics. , 2018, , .		2
128	Computational Study of Graphene Nanoribbon Resonant Tunneling Diodes. , 2009, , .		1
129	Electronic Structure of Bilayer Graphene Nanoribbon and Its Device Application: A Computational Study. Nanoscience and Technology, 2011, , 509-527.	1.5	1
130	Performance comparison of III-V MOSFETs with source filter for electron energy. , 2012, , .		1
131	Is sub-10nm thick 3D-topological insulator good for the local electrical interconnects?. , 2013, , .		1
132	Carrier transport in Bi2Se3 topological insulator slab. Physica E: Low-Dimensional Systems and Nanostructures, 2015, 74, 10-19.	1.3	1
133	Monolithic integration of InGaAs n-FETs and lasers on Ge substrate. Optics Express, 2017, 25, 5146.	1.7	1
134	Guest Editorial Special Issue on 2-D Materials for Electronic, Optoelectronic, and Sensor Devices. IEEE Transactions on Electron Devices, 2018, 65, 4034-4039.	1.6	1
135	A Computational Performance Evaluation of Negative-Capacitance MOSFETs based on Ultra-thin body Silicon and Monolayer MoS2. , 2019, , .		1
136	Hybrid-basis modeling of electron transport through molecules on silicon. , 2004, , .		0
137	A pseudopotential method for investigating the surface roughness effect in ultrathin body transistors. Journal of Physics Condensed Matter, 2008, 20, 235229.	0.7	0
138	A first-principles study on edge doping of armchair graphene nanoribbon. , 2008, , .		0
139	A computational study on the device performance of graphene nanoribbon heterojunction tunneling FETs based on bandgap engineering. , 2010, , .		0
140	Source/drain doping influence on heterojunction graphene nanoribbon tunneling field effect transistors. , 2011, , .		0
141	Performance comparison of armchair-edged and nitrogen-doped zigzag-edged graphene nanoribbon schottky barrier field-effect transistors. , 2011, , .		0
142	Voltage scalability of double-gate ultra-thin-body field-effect transistors with channel materials from group IV, III-V to 2D-materials based on ITRS metrics for year 2018 and beyond. , 2014, , .		0
143	Germanium-Tin on Silicon avalanche photodiode for short-wave infrared imaging. , 2014, , .		0
144	(Invited) Enabling Hetero-Integration of III-V and Ge-Based Transistors on Silicon with Ultra-Thin Buffers Formed by Interfacial Misfit Technique. ECS Transactions, 2016, 75, 421-437.	0.3	0

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145	Performance evaluation of nanoscale FETs based on full-band complex bandstructure and real space poisson solver. , 2016, , .		0
146	Torque engineering in trilayer spin-hall system. Journal Physics D: Applied Physics, 2016, 49, 045004.	1.3	0
147	Wave Function Parity Loss Used to Mitigate Thermal Broadening in Spin-orbit Coupled Zigzag Graphene Analogues. Scientific Reports, 2017, 7, 40546.	1.6	0
148	2D Materials: Single Atomically Sharp Lateral Monolayer pâ€n Heterojunction Solar Cells with Extraordinarily High Power Conversion Efficiency (Adv. Mater. 32/2017). Advanced Materials, 2017, 29, .	11.1	0
149	Device Performance of 2D Layered Material Transistors and Their Challenges: A Theoretical Study. , 2018, , .		0
150	A Computational Performance Evaluation of Negative-Capacitance MOSFETs based on Ultra-thin body Silicon and Monolayer MoS2. , 2020, , .		0