Wei Cai

List of Publications by Citations

152 papers	22,534 citations	49 h-index	150 g-index
157 ext. papers	24,437 ext. citations	7.1 avg, IF	6.6 L-index

#	Paper	IF	Citations
152	Large-area synthesis of high-quality and uniform graphene films on copper foils. *Science*, **2009**, 324, 1312-4	33.3	8900
151	Carbon-based supercapacitors produced by activation of graphene. *Science*, **2011**, 332, 1537-41	33.3	4940
150	Synthesis and solid-state NMR structural characterization of 13C-labeled graphite oxide. *Science*, **2008**, 321, 1815-7	33.3	1006
149	Highly stretchable polymer semiconductor films through the nanoconfinement effect. *Science*, **2017**, 355, 59-64	33.3	651
148	Enabling strain hardening simulations with dislocation dynamics. *Modelling and Simulation in Materials Science and Engineering*, **2007**, 15, 553-595	2	341
147	Nanohybrid Shish-Kebabs: Periodically Functionalized Carbon Nanotubes. *Advanced Materials*, **2005**, 17, 1198-1202	24	315
146	A non-singular continuum theory of dislocations. *Journal of the Mechanics and Physics of Solids*, **2006**, 54, 561-587	5	303
145	A Bamboo-Inspired Nanostructure Design for Flexible, Foldable, and Twistable Energy Storage Devices. *Nano Letters*, **2015**, 15, 3899-906	11.5	257
144	Computer Simulations of Dislocations **2006**,		246
143	Dislocation multi-junctions and strain hardening. *Nature*, **2006**, 440, 1174-8	50.4	225
142	Dynamic transitions from smooth to rough to twinning in dislocation motion. *Nature Materials*, **2004**, 3, 158-63	27	213
141	Surface-controlled dislocation multiplication in metal micropillars. *Proceedings of the National Academy of Sciences of the United States of America*, **2008**, 105, 14304-7	11.5	184
140	Minimizing boundary reflections in coupled-domain simulations. *Physical Review Letters*, **2000**, 85, 3213-6	7.4	182
139	Comparing the strength of f.c.c. and b.c.c. sub-micrometer pillars: Compression experiments and dislocation dynamics simulations. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2008**, 493, 21-25	5.3	181
138	Periodic image effects in dislocation modelling. *Philosophical Magazine*, **2003**, 83, 539-567	1.6	166
137	Plasticity of metal nanowires. *Journal of Materials Chemistry*, **2012**, 22, 3277		157
136	Mechanics of Crystalline Nanowires. *MRS Bulletin*, **2009**, 34, 178-183	3.2	144

135	Modeling of dislocation grain boundary interactions in FCC metals. *Journal of Nuclear Materials*, **2003**, 323, 281-289	3.3	126
134	Brittle and ductile fracture of semiconductor nanowires molecular dynamics simulations. *Philosophical Magazine*, **2007**, 87, 2169-2189	1.6	118
133	Size and temperature effects on the fracture mechanisms of silicon nanowires: Molecular dynamics simulations. *International Journal of Plasticity*, **2010**, 26, 1387-1401	7.6	108
132	Entropic effect on the rate of dislocation nucleation. *Proceedings of the National Academy of Sciences of the United States of America*, **2011**, 108, 5174-8	11.5	103
131	Stretchable self-healable semiconducting polymer film for active-matrix strain-sensing array. *Science Advances*, **2019**, 5, eaav3097	14.3	102
130	Core energy and Peierls stress of a screw dislocation in bcc molybdenum: A periodic-cell tight-binding study. *Physical Review B*, **2004**, 70,	3.3	97
129	Synthesis and Photoluminescence Properties of Truncated Octahedral Eu-Doped YF3 Submicrocrystals or Nanocrystals. *Journal of Physical Chemistry C*, **2007**, 111, 3241-3245	3.8	88
128	Dislocation Core Effects on Mobility. *Dislocations in Solids*, **2004**, 12, 1-80		87
127	Anisotropic elastic interactions of a periodic dislocation array. *Physical Review Letters*, **2001**, 86, 5727-30	7.4	87
126	Mobility laws in dislocation dynamics simulations. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2004**, 387-389, 277-281	5.3	84
125	Nucleation-controlled distributed plasticity in penta-twinned silver nanowires. *Small*, **2012**, 8, 2986-93	11	83
124	Direct observation of mineral-organic composite formation reveals occlusion mechanism. *Nature Communications*, **2016**, 7, 10187	17.4	82
123	Imperfections in Crystalline Solids **2016**,		75
122	Microstructural origin of resistance-strain hysteresis in carbon nanotube thin film conductors. *Proceedings of the National Academy of Sciences of the United States of America*, **2018**, 115, 1986-1991	11.5	73
121	In situ atomic-scale observation of oxygen-driven core-shell formation in PtCo nanoparticles. *Nature Communications*, **2017**, 8, 204	17.4	71
120	Energy barrier for homogeneous dislocation nucleation: Comparing atomistic and continuum models. *Scripta Materialia*, **2011**, 64, 1043-1046	5.6	71
119	Atomistic simulations of surface segregation of defects in solid oxide electrolytes. *Acta Materialia*, **2010**, 58, 2197-2206	8.4	69
118	Molecular dynamics simulations of motion of edge and screw dislocations in a metal. *Computational Materials Science*, **2002**, 23, 111-115	3.2	69

117	Singular orientations and faceted motion of dislocations in body-centered cubic crystals. *Proceedings of the National Academy of Sciences of the United States of America*, **2012**, 109, 15174-8	11.5	68
116	Intrinsic Bauschinger effect and recoverable plasticity in pentatwinned silver nanowires tested in tension. *Nano Letters*, **2015**, 15, 139-46	11.5	67
115	Intrinsic mobility of a dissociated dislocation in silicon. *Physical Review Letters*, **2000**, 84, 3346-9	7.4	66
114	Atomistic simulations of grain boundary segregation in nanocrystalline yttria-stabilized zirconia and gadolinia-doped ceria solid oxide electrolytes. *Acta Materialia*, **2013**, 61, 3872-3887	8.4	60
113	Parameter-free modelling of dislocation motion: The case of silicon. *Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties*, **2001**, 81, 1257-1281		60
112	Predicting the dislocation nucleation rate as a function of temperature and stress. *Journal of Materials Research*, **2011**, 26, 2335-2354	2.5	56
111	Dislocation motion in BCC metals by molecular dynamics. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2001**, 309-310, 160-163	5.3	56
110	Plasticity of metal wires in torsion: Molecular dynamics and dislocation dynamics simulations. *Journal of the Mechanics and Physics of Solids*, **2010**, 58, 1011-1025	5	55
109	Anomalous dislocation multiplication in FCC metals. *Physical Review Letters*, **2003**, 91, 025503	7.4	55
108	Stress dependence of cross slip energy barrier for face-centered cubic nickel. *Journal of the Mechanics and Physics of Solids*, **2014**, 62, 181-193	5	54
107	Role of Surface Roughness in Hysteresis during Adhesive Elastic Contact. *Philosophical Magazine Letters*, **2010**, 90, 891-902	1	54
106	Microparticle traction force microscopy reveals subcellular force exertion patterns in immune cell-target interactions. *Nature Communications*, **2020**, 11, 20	17.4	52
105	Orientation-dependent plasticity in metal nanowires under torsion: twist boundary formation and Eshelby twist. *Nano Letters*, **2010**, 10, 139-42	11.5	51
104	Modeling a distribution of point defects as misfitting inclusions in stressed solids. *Journal of the Mechanics and Physics of Solids*, **2014**, 66, 154-171	5	49
103	Vacancy interaction with dislocations in silicon: the shuffle-glide competition. *Physical Review Letters*, **2000**, 84, 2172-5	7.4	49
102	Modelling dislocations in a free-standing thin film. *Modelling and Simulation in Materials Science and Engineering*, **2009**, 17, 075007	2	48
101	Dislocation Networks and the Microstructural Origin of Strain Hardening. *Physical Review Letters*, **2018**, 121, 085501	7.4	46
100	Computing image stress in an elastic cylinder. *Journal of the Mechanics and Physics of Solids*, **2007**, 55, 2027-2054	5	45

99	Kink Asymmetry and Multiplicity in Dislocation Cores. *Physical Review Letters*, **1997**, 79, 5042-5045	7.4	44
98	Nodal effects in dislocation mobility. *Physical Review Letters*, **2002**, 89, 115501	7.4	44
97	Plasticity of bcc micropillars controlled by competition between dislocation multiplication and depletion. *Acta Materialia*, **2013**, 61, 3233-3241	8.4	42
96	Stochastic behaviors in plastic deformation of face-centered cubic micropillars governed by surface nucleation and truncated source operation. *Acta Materialia*, **2015**, 95, 176-183	8.4	41
95	Validity of classical nucleation theory for Ising models. *Physical Review E*, **2010**, 81, 030601	2.4	40
94	Improved modified embedded-atom method potentials for gold and silicon. *Modelling and Simulation in Materials Science and Engineering*, **2009**, 17, 075008	2	40
93	A hybrid method for computing forces on curved dislocations intersecting free surfaces in three-dimensional dislocation dynamics. *Modelling and Simulation in Materials Science and Engineering*, **2006**, 14, 1139-1151	2	40
92	Dislocation contribution to acoustic nonlinearity: The effect of orientation-dependent line energy. *Journal of Applied Physics*, **2011**, 109, 014915	2.5	39
91	Comparison of thermal properties predicted by interatomic potential models. *Modelling and Simulation in Materials Science and Engineering*, **2008**, 16, 085005	2	39
90	Solute drag on perfect and extended dislocations. *Philosophical Magazine*, **2016**, 96, 895-921	1.6	36
89	Zipping, entanglement, and the elastic modulus of aligned single-walled carbon nanotube films. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 20426-30	11.5	36
88	Analysis of the elastic strain energy driving force for grain boundary migration using phase field simulation. *Scripta Materialia*, **2010**, 63, 1049-1052	5.6	34
87	Kinetic Monte Carlo modeling of dislocation motion in BCC metals. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2001**, 309-310, 270-273	5.3	33
86	Synthesis of nano-AgI arrays and their optical properties. *Journal of Materials Research*, **2001**, 16, 990-992	2.5	33
85	Stress-driven migration of simple low-angle mixed grain boundaries. *Acta Materialia*, **2012**, 60, 1395-1407	8.4	32
84	Enhancing ionic conductivity of bulk single-crystal yttria-stabilized zirconia by tailoring dopant distribution. *Physical Review B*, **2011**, 83,	3.3	32
83	Torsion and bending periodic boundary conditions for modeling the intrinsic strength of nanowires. *Journal of the Mechanics and Physics of Solids*, **2008**, 56, 3242-3258	5	32
82	Synthesis and photoluminescence properties of hexagonal Lanthanide(III)-doped NaYF4 microprisms. *CrystEngComm*, **2010**, 12, 4263	3.3	29

81	Equilibrium shape of dislocation shear loops in anisotropic α-Fe. *Modelling and Simulation in Materials Science and Engineering*, **2011**, 19, 065006	2	29
80	Advanced time integration algorithms for dislocation dynamics simulations of work hardening. *Modelling and Simulation in Materials Science and Engineering*, **2016**, 24, 045019	2	29
79	The stability of Lomer–Cottrell jogs in nanopillars. *Scripta Materialia*, **2011**, 64, 529-532	5.6	28
78	Efficient computation of forces on dislocation segments in anisotropic elasticity. *Modelling and Simulation in Materials Science and Engineering*, **2010**, 18, 045013	2	28
77	Spatiotemporal periodicity of dislocation dynamics in a two-dimensional microfluidic crystal flowing in a tapered channel. *Proceedings of the National Academy of Sciences of the United States of America*, **2016**, 113, 12082-12087	11.5	27
76	Dislocation dynamics simulation of Frank-Read sources in anisotropic α-Fe. *Modelling and Simulation in Materials Science and Engineering*, **2012**, 20, 045022	2	24
75	Contribution of dislocation dipole structures to the acoustic nonlinearity. *Journal of Applied Physics*, **2012**, 111, 074906	2.5	24
74	Numerical tests of nucleation theories for the Ising models. *Physical Review E*, **2010**, 82, 011603	2.4	23
73	Molecular Dynamics **2012**, 249-265		22
72	Free energy change of a dislocation due to a Cottrell atmosphere. *Philosophical Magazine*, **2018**, 98, 1491-1510	1.6	20
71	Fundamentals of Dislocation Dynamics Simulations. *Springer Series in Materials Science*, **2016**, 53-87	0.9	20
70	Massively-Parallel Dislocation Dynamics Simulations. *Solid Mechanics and Its Applications*, **2004**, 1-11	0.4	20
69	Frontiers in the Simulation of Dislocations. *Annual Review of Materials Research*, **2020**, 50, 437-464	12.8	19
68	Ab initio calculations in a uniform magnetic field using periodic supercells. *Physical Review Letters*, **2004**, 92, 186402	7.4	19
67	Reliability of Single Crystal Silver Nanowire-Based Systems: Stress Assisted Instabilities. *ACS Nano*, **2017**, 11, 4768-4776	16.7	18
66	Nanoscale patterning controls inorganic-membrane interface structure. *Nanoscale*, **2011**, 3, 391-400	7.7	17
65	Importance sampling of rare transition events in Markov processes. *Physical Review E*, **2002**, 66, 046703	2.4	17
64	Efficient free-energy calculations by the simulation of nonequilibrium processes. *Computing in Science and Engineering*, **2000**, 2, 88-96	1.5	17

63	A three-dimensional phase field model for nanowire growth by the vapor□liquid□solid mechanism. *Modelling and Simulation in Materials Science and Engineering*, **2014**, 22, 055005	2	16
62	A gold-silicon potential fitted to the binary phase diagram. *Journal of Physics Condensed Matter*, **2010**, 22, 055401	1.8	16
61	Kinetic Monte Carlo method for dislocation glide in silicon. *Journal of Computer-Aided Materials Design*, **1999**, 6, 175-183		16
60	Conditional convergence in two-dimensional dislocation dynamics. *Modelling and Simulation in Materials Science and Engineering*, **2013**, 21, 055003	2	15
59	Computing dislocation stress fields in anisotropic elastic media using fast multipole expansions. *Modelling and Simulation in Materials Science and Engineering*, **2012**, 20, 045015	2	14
58	Molecular dynamics simulations of gold-catalyzed growth of silicon bulk crystals and nanowires. *Journal of Materials Research*, **2011**, 26, 2199-2206	2.5	14
57	Dislocation junctions and jogs in a free-standing FCC thin film. *Modelling and Simulation in Materials Science and Engineering*, **2011**, 19, 025002	2	14
56	Multivalent Assembly of Flexible Polymer Chains into Supramolecular Nanofibers. *Journal of the American Chemical Society*, **2020**, 142, 16814-16824	16.4	14
55	Anisotropic Size-Dependent Plasticity in Face-Centered Cubic Micropillars Under Torsion. *Jom*, **2016** , 68, 253-260	2.1	13
54	Phase Field Model for Morphological Transition in Nanowire Vapor□liquid□Solid Growth. *Crystal Growth and Design*, **2017**, 17, 2211-2217	3.5	12
53	Coupling of coherent misfit strain and composition distributions in core□shell Ge/Ge1-xSnx nanowire light emitters. *Materials Today Nano*, **2019**, 5, 100026	9.7	12
52	Discrete shear band plasticity through dislocation activities in body-centered cubic tungsten nanowires. *Scientific Reports*, **2018**, 8, 4574	4.9	12
51	Spontaneous, Defect-Free Kinking via Capillary Instability during Vapor-Liquid-Solid Nanowire Growth. *Nano Letters*, **2016**, 16, 1713-8	11.5	12
50	Energy of a Prismatic Dislocation Loop in an Elastic Cylinder. *Mathematics and Mechanics of Solids*, **2009**, 14, 192-206	2.3	12
49	Quantum entanglement of formation between qudits. *Physical Review A*, **2008**, 77,	2.6	12
48	Kinetic Monte Carlo approach to modeling dislocation mobility. *Computational Materials Science*, **2002**, 23, 124-130	3.2	12
47	Topological origin of strain induced damage of multi-network elastomers by bond breaking. *Extreme Mechanics Letters*, **2020**, 40, 100883	3.9	12
46	Dislocation Structure and Mobility in hcp ^{4}He. *Physical Review Letters*, **2016**, 117, 045301	7.4	11

45	Computation of virtual X-ray diffraction patterns from discrete dislocation structures. *Computational Materials Science*, **2018**, 146, 268-277	3.2	10
44	Efficient time integration in dislocation dynamics. *Modelling and Simulation in Materials Science and Engineering*, **2014**, 22, 025003	2	10
43	Ab initiokinetic Monte Carlo model of ionic conduction in bulk yttria-stabilized zirconia. *Modelling and Simulation in Materials Science and Engineering*, **2012**, 20, 065006	2	10
42	Geometric aspects of the ideal shear resistance in simple crystal lattices. *Philosophical Magazine*, **2006**, 86, 3847-3859	1.6	10
41	On the existence of Eshelby□ equivalent ellipsoidal inclusion solution. *Mathematics and Mechanics of Solids*, **2012**, 17, 840-847	2.3	9
40	Kinetic Monte Carlo method for dislocation migration in the presence of solute. *Physical Review B*, **2005**, 71,	3.3	9
39	Point defect interaction with dislocations in silicon. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2001**, 309-310, 129-132	5.3	9
38	Growth mode control for direct-gap core/shell Ge/GeSn nanowire light emission. *Materials Today*, **2020**, 40, 101-113	21.8	9
37	GPU-accelerated dislocation dynamics using subcycling time-integration. *Modelling and Simulation in Materials Science and Engineering*, **2019**, 27, 075014	2	8
36	Kinetic Monte Carlo simulations of oxygen vacancy diffusion in a solid electrolyte: Computing the electrical impedance using the fluctuation□dissipation theorem. *Electrochemistry Communications*, **2010**, 12, 223-226	5.1	8
35	Spherical harmonics method for computing the image stress due to a spherical void. *Journal of the Mechanics and Physics of Solids*, **2019**, 126, 151-167	5	7
34	Energy of periodic discrete dislocation networks. *Journal of the Mechanics and Physics of Solids*, **2018**, 121, 133-146	5	7
33	Ideal shear strength of a quantum crystal. *Physical Review Letters*, **2014**, 112, 155303	7.4	7
32	High-Throughput Growth of Microscale Gold Bicrystals for Single-Grain-Boundary Studies. *Advanced Materials*, **2019**, 31, e1902189	24	6
31	Dislocation density-based plasticity model from massive discrete dislocation dynamics database. *Journal of the Mechanics and Physics of Solids*, **2020**, 145, 104152	5	6
30	Geometrically projected discrete dislocation dynamics. *Modelling and Simulation in Materials Science and Engineering*, **2018**, 26, 065011	2	6
29	Adaptive importance sampling Monte Carlo simulation of rare transition events. *Journal of Chemical Physics*, **2005**, 122, 074103	3.9	6
28	Effects of methane partial pressure on synthesis of single-walled carbon nanotubes by chemical vapor deposition. *Journal of Materials Science*, **2003**, 38, 3051-3054	4.3	6

27	Stress effects on the energy barrier and mechanisms of cross-slip in FCC nickel. *Journal of the Mechanics and Physics of Solids*, **2020**, 144, 104105	5	6
26	Strengthening Mechanism of a Single Precipitate in a Metallic Nanocube. *Nano Letters*, **2019**, 19, 255-260	11.5	6
25	Molecular Dynamics **2020**, 573-594		5
24	A spectral approach for discrete dislocation dynamics simulations of nanoindentation. *Modelling and Simulation in Materials Science and Engineering*, **2018**, 26, 055004	2	5
23	Anisotropy effect on strain-induced instability during growth of heteroepitaxial films. *Journal of Materials Science*, **2018**, 53, 5777-5785	4.3	5
22	Evaluation of the Surface Tension of Silicon-Gold Binary Liquid Alloy. *Materials Science Forum*, **2015**, 817, 772-777	0.4	5
21	Electronic structure calculations in a uniform magnetic field using periodic supercells. *Journal of Computational Physics*, **2007**, 226, 1310-1331	4.1	5
20	Modeling Dislocations Using a Periodic Cell **2005**, 813-826		4
19	Anisotropy of the reflectivity spectra of a BiSrCaCuO single crystal within the (001) plane. *Applied Physics Letters*, **1991**, 58, 1098-1099	3.4	4
18	A critical look at the prediction of the temperature field around a laser-induced melt pool on metallic substrates. *Scientific Reports*, **2021**, 11, 12224	4.9	4
17	A novel experimental method for in situ strain measurement during selective laser melting. *Virtual and Physical Prototyping*, **2020**, 15, 583-595	10.1	3
16	Dislocation dynamics simulations in a cylinder. *IOP Conference Series: Materials Science and Engineering*, **2009**, 3, 012007	0.4	3
15	Dynamics of Dissociated Dislocations in SI: A Micro-Meso Simulation Methodology. *Materials Research Society Symposia Proceedings*, **1998**, 538, 69		3
14	Superresolved microparticle traction force microscopy reveals subcellular force patterns in immune cell-target interactions		3
13	Intrinsic size dependent plasticity in BCC micro-pillars under uniaxial tension and pure torsion. *Extreme Mechanics Letters*, **2020**, 40, 100901	3.9	3
12	Phase-field investigation of the stages in radial growth of core-shell Ge/GeSn nanowires. *Nanoscale*, **2019**, 11, 21974-21980	7.7	3
11	Stability of Eshelby dislocations in FCC crystalline nanowires. *International Journal of Plasticity*, **2016**, 86, 26-36	7.6	2
10	Properties of the Eshelby tensor and existence of the equivalent ellipsoidal inclusion solution. *Journal of the Mechanics and Physics of Solids*, **2018**, 121, 71-80	5	2

9	Atomistic mechanisms of orientation and temperature dependence in gold-catalyzed silicon growth. *Journal of Applied Physics*, **2017**, 122, 085106	2.5	2
8	Bending and precipitate formation mechanisms in epitaxial Ge-core/GeSn-shell nanowires. *Nanoscale*, **2021**, 13, 17547-17555	7.7	2
7	Phagocytic 'teeth' and myosin-II 'jaw' power target constriction during phagocytosis. *ELife*, **2021**, 10,	8.9	2
6	Slip-free multiplication and complexity of dislocation networks in FCC metals. *Materials Theory*, **2021**, 5,	2.2	2
5	Pipe-diffusion-enriched dislocations and interfaces in SnSe/PbSe heterostructures. *Physical Review Materials*, **2021**, 5,	3.2	2
4	Electro-chemo-mechanical charge carrier equilibrium at interfaces. *Physical Chemistry Chemical Physics*, **2021**, 23, 23730-23740	3.6	1
3	Phagocytic □eeth□ and myosin-II □aw□ power target constriction during phagocytosis		1
2	Core energies of dislocations in bcc metals. *Physical Review Materials*, **2021**, 5,	3.2	1
1	Predicting stability of nanofin arrays against collapse by phase field modeling. *Journal of Vacuum Science and Technology B:Nanotechnology and Microelectronics*, **2018**, 36, 051602	1.3	1