

Wei Cai

List of Publications by Year in descending order

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149
papers

26,108
citations

44444

50
h-index

9865

146
g-index

157
all docs

157
docs citations

157
times ranked

36637
citing authors

#	ARTICLE	IF	CITATIONS
1	Correlative image learning of chemo-mechanics in phase-transforming solids. <i>Nature Materials</i> , 2022, 21, 547-554.	13.3	27
2	Core energies of dislocations in bcc metals. <i>Physical Review Materials</i> , 2021, 5, .	0.9	9
3	Slip-free multiplication and complexity of dislocation networks in FCC metals. <i>Materials Theory</i> , 2021, 5, .	2.2	8
4	A critical look at the prediction of the temperature field around a laser-induced melt pool on metallic substrates. <i>Scientific Reports</i> , 2021, 11, 12224.	1.6	12
5	Pipe-diffusion-enriched dislocations and interfaces in SnSe/PbSe heterostructures. <i>Physical Review Materials</i> , 2021, 5, .	0.9	4
6	Electro-chemo-mechanical charge carrier equilibrium at interfaces. <i>Physical Chemistry Chemical Physics</i> , 2021, 23, 23730-23740.	1.3	2
7	Bending and precipitate formation mechanisms in epitaxial Ge-core/GeSn-shell nanowires. <i>Nanoscale</i> , 2021, 13, 17547-17555.	2.8	6
8	Phagocytic "teeth"™ and myosin-II "jaw"™ power target constriction during phagocytosis. <i>ELife</i> , 2021, 10, 2.8		35
9	Microparticle traction force microscopy reveals subcellular force exertion patterns in immune cell-target interactions. <i>Nature Communications</i> , 2020, 11, 20.	5.8	101
10	Intrinsic size dependent plasticity in BCC micro-pillars under uniaxial tension and pure torsion. <i>Extreme Mechanics Letters</i> , 2020, 40, 100901.	2.0	11
11	Stress effects on the energy barrier and mechanisms of cross-slip in FCC nickel. <i>Journal of the Mechanics and Physics of Solids</i> , 2020, 144, 104105.	2.3	16
12	Topological origin of strain induced damage of multi-network elastomers by bond breaking. <i>Extreme Mechanics Letters</i> , 2020, 40, 100883.	2.0	19
13	Growth mode control for direct-gap core/shell Ge/GeSn nanowire light emission. <i>Materials Today</i> , 2020, 40, 101-113.	8.3	22
14	Multivalent Assembly of Flexible Polymer Chains into Supramolecular Nanofibers. <i>Journal of the American Chemical Society</i> , 2020, 142, 16814-16824.	6.6	33
15	A novel experimental method for <i>in situ</i> strain measurement during selective laser melting. <i>Virtual and Physical Prototyping</i> , 2020, 15, 583-595.	5.3	5
16	Dislocation density-based plasticity model from massive discrete dislocation dynamics database. <i>Journal of the Mechanics and Physics of Solids</i> , 2020, 145, 104152.	2.3	19
17	Frontiers in the Simulation of Dislocations. <i>Annual Review of Materials Research</i> , 2020, 50, 437-464.	4.3	36
18	Molecular Dynamics. , 2020, , 573-594.		6

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19	GPU-accelerated dislocation dynamics using subcycling time-integration. Modelling and Simulation in Materials Science and Engineering, 2019, 27, 075014.	0.8	13
20	Stretchable self-healable semiconducting polymer film for active-matrix strain-sensing array. Science Advances, 2019, 5, eaav3097.	4.7	179
21	Coupling of coherent misfit strain and composition distributions in core-shell Ge/Ge _{1-x} Sn _x nanowire light emitters. Materials Today Nano, 2019, 5, 100026.	2.3	17
22	High-Throughput Growth of Microscale Gold Bicrystals for Single-Grain Boundary Studies. Advanced Materials, 2019, 31, 1902189.	11.1	6
23	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.	2.3	11
24	Phase-field investigation of the stages in radial growth of core-shell Ge/Ge _{1-x} Sn _x nanowires. Nanoscale, 2019, 11, 21974-21980.	2.8	3
25	Strengthening Mechanism of a Single Precipitate in a Metallic Nanocube. Nano Letters, 2019, 19, 255-260.	4.5	13
26	Computation of virtual X-ray diffraction patterns from discrete dislocation structures. Computational Materials Science, 2018, 146, 268-277.	1.4	11
27	A spectral approach for discrete dislocation dynamics simulations of nanoindentation. Modelling and Simulation in Materials Science and Engineering, 2018, 26, 055004.	0.8	7
28	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.	3.3	107
29	Anisotropy effect on strain-induced instability during growth of heteroepitaxial films. Journal of Materials Science, 2018, 53, 5777-5785.	1.7	5
30	Discrete shear band plasticity through dislocation activities in body-centered cubic tungsten nanowires. Scientific Reports, 2018, 8, 4574.	1.6	22
31	Free energy change of a dislocation due to a Cottrell atmosphere. Philosophical Magazine, 2018, 98, 1491-1510.	0.7	27
32	Predicting stability of nanofin arrays against collapse by phase field modeling. Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics, 2018, 36, 051602.	0.6	2
33	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.	2.3	9
34	Geometrically projected discrete dislocation dynamics. Modelling and Simulation in Materials Science and Engineering, 2018, 26, 065011.	0.8	6
35	Energy of periodic discrete dislocation networks. Journal of the Mechanics and Physics of Solids, 2018, 121, 133-146.	2.3	11
36	Dislocation Networks and the Microstructural Origin of Strain Hardening. Physical Review Letters, 2018, 121, 085501.	2.9	83

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37	Highly stretchable polymer semiconductor films through the nanoconfinement effect. <i>Science</i> , 2017, 355, 59-64.	6.0	897
38	Reliability of Single Crystal Silver Nanowire-Based Systems: Stress Assisted Instabilities. <i>ACS Nano</i> , 2017, 11, 4768-4776.	7.3	26
39	Phase Field Model for Morphological Transition in Nanowire Vapor-Liquid-Solid Growth. <i>Crystal Growth and Design</i> , 2017, 17, 2211-2217.	1.4	12
40	Atomistic mechanisms of orientation and temperature dependence in gold-catalyzed silicon growth. <i>Journal of Applied Physics</i> , 2017, 122, 085106.	1.1	3
41	In situ atomic-scale observation of oxygen-driven core-shell formation in Pt ₃ Co nanoparticles. <i>Nature Communications</i> , 2017, 8, 204.	5.8	102
42	Advanced time integration algorithms for dislocation dynamics simulations of work hardening. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2016, 24, 045019.	0.8	37
43	Spatiotemporal periodicity of dislocation dynamics in a two-dimensional microfluidic crystal flowing in a tapered channel. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2016, 113, 12082-12087.	3.3	32
44	Dislocation Structure and Mobility in hcpHe4. <i>Physical Review Letters</i> , 2016, 117, 045301.	2.9	17
45	Stability of Eshelby dislocations in FCC crystalline nanowires. <i>International Journal of Plasticity</i> , 2016, 86, 26-36.	4.1	2
46	Anisotropic Size-Dependent Plasticity in Face-Centered Cubic Micropillars Under Torsion. <i>Jom</i> , 2016, 68, 253-260.	0.9	15
47	Direct observation of mineral-organic composite formation reveals occlusion mechanism. <i>Nature Communications</i> , 2016, 7, 10187.	5.8	110
48	Solute drag on perfect and extended dislocations. <i>Philosophical Magazine</i> , 2016, 96, 895-921.	0.7	53
49	Spontaneous, Defect-Free Kinking via Capillary Instability during Vapor-Liquid-Solid Nanowire Growth. <i>Nano Letters</i> , 2016, 16, 1713-1718.	4.5	15
50	Fundamentals of Dislocation Dynamics Simulations. <i>Springer Series in Materials Science</i> , 2016, , 53-87.	0.4	29
51	Stochastic behaviors in plastic deformation of face-centered cubic micropillars governed by surface nucleation and truncated source operation. <i>Acta Materialia</i> , 2015, 95, 176-183.	3.8	51
52	A Bamboo-Inspired Nanostructure Design for Flexible, Foldable, and Twistable Energy Storage Devices. <i>Nano Letters</i> , 2015, 15, 3899-3906.	4.5	296
53	Intrinsic Bauschinger Effect and Recoverable Plasticity in Pentatwinned Silver Nanowires Tested in Tension. <i>Nano Letters</i> , 2015, 15, 139-146.	4.5	82
54	A three-dimensional phase field model for nanowire growth by the vapor-liquid-solid mechanism. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2014, 22, 055005.	0.8	16

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55	Efficient time integration in dislocation dynamics. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2014, 22, 025003.	0.8	13
56	Ideal Shear Strength of a Quantum Crystal. <i>Physical Review Letters</i> , 2014, 112, 155303.	2.9	9
57	Modeling a distribution of point defects as misfitting inclusions in stressed solids. <i>Journal of the Mechanics and Physics of Solids</i> , 2014, 66, 154-171.	2.3	63
58	Stress dependence of cross slip energy barrier for face-centered cubic nickel. <i>Journal of the Mechanics and Physics of Solids</i> , 2014, 62, 181-193.	2.3	62
59	Zippering, entanglement, and the elastic modulus of aligned single-walled carbon nanotube films. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2013, 110, 20426-20430.	3.3	40
60	Plasticity of bcc micropillars controlled by competition between dislocation multiplication and depletion. <i>Acta Materialia</i> , 2013, 61, 3233-3241.	3.8	44
61	Atomistic simulations of grain boundary segregation in nanocrystalline yttria-stabilized zirconia and gadolinia-doped ceria solid oxide electrolytes. <i>Acta Materialia</i> , 2013, 61, 3872-3887.	3.8	68
62	Conditional convergence in two-dimensional dislocation dynamics. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2013, 21, 055003.	0.8	19
63	Contribution of dislocation dipole structures to the acoustic nonlinearity. <i>Journal of Applied Physics</i> , 2012, 111, .	1.1	35
64	Singular orientations and faceted motion of dislocations in body-centered cubic crystals. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, 15174-15178.	3.3	80
65	<i>Ab initio</i> kinetic Monte Carlo model of ionic conduction in bulk yttria-stabilized zirconia. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2012, 20, 065006.	0.8	12
66	Plasticity of metal nanowires. <i>Journal of Materials Chemistry</i> , 2012, 22, 3277.	6.7	182
67	On the existence of Eshelby's equivalent ellipsoidal inclusion solution. <i>Mathematics and Mechanics of Solids</i> , 2012, 17, 840-847.	1.5	9
68	<i>Molecular Dynamics</i> . , 2012, , 249-265.		24
69	Computing dislocation stress fields in anisotropic elastic media using fast multipole expansions. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2012, 20, 045015.	0.8	15
70	Nucleation-controlled Distributed Plasticity in Pentatwinned Silver Nanowires. <i>Small</i> , 2012, 8, 2986-2993.	5.2	101
71	Dislocation dynamics simulation of Frank-Read sources in anisotropic $\hat{\pm}$ -Fe. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2012, 20, 045022.	0.8	25
72	Stress-driven migration of simple low-angle mixed grain boundaries. <i>Acta Materialia</i> , 2012, 60, 1395-1407.	3.8	33

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73	Dislocation contribution to acoustic nonlinearity: The effect of orientation-dependent line energy. Journal of Applied Physics, 2011, 109, .	1.1	53
74	The stability of Lomer–Cottrell jogs in nanopillars. Scripta Materialia, 2011, 64, 529-532.	2.6	33
75	Energy barrier for homogeneous dislocation nucleation: Comparing atomistic and continuum models. Scripta Materialia, 2011, 64, 1043-1046.	2.6	86
76	Nanoscale patterning controls inorganic–membrane interface structure. Nanoscale, 2011, 3, 391-400.	2.8	18
77	Carbon-Based Supercapacitors Produced by Activation of Graphene. Science, 2011, 332, 1537-1541.	6.0	5,528
78	Enhancing ionic conductivity of bulk single-crystal yttria-stabilized zirconia by tailoring dopant distribution. Physical Review B, 2011, 83, .	1.1	34
79	Entropic effect on the rate of dislocation nucleation. Proceedings of the National Academy of Sciences of the United States of America, 2011, 108, 5174-5178.	3.3	117
80	Molecular dynamics simulations of gold-catalyzed growth of silicon bulk crystals and nanowires. Journal of Materials Research, 2011, 26, 2199-2206.	1.2	17
81	Predicting the dislocation nucleation rate as a function of temperature and stress. Journal of Materials Research, 2011, 26, 2335-2354.	1.2	71
82	Dislocation junctions and jogs in a free-standing FCC thin film. Modelling and Simulation in Materials Science and Engineering, 2011, 19, 025002.	0.8	16
83	Equilibrium shape of dislocation shear loops in anisotropic $\hat{\Gamma}$ -Fe. Modelling and Simulation in Materials Science and Engineering, 2011, 19, 065006.	0.8	30
84	Size and temperature effects on the fracture mechanisms of silicon nanowires: Molecular dynamics simulations. International Journal of Plasticity, 2010, 26, 1387-1401.	4.1	129
85	Atomistic simulations of surface segregation of defects in solid oxide electrolytes. Acta Materialia, 2010, 58, 2197-2206.	3.8	78
86	Analysis of the elastic strain energy driving force for grain boundary migration using phase field simulation. Scripta Materialia, 2010, 63, 1049-1052.	2.6	42
87	Plasticity of metal wires in torsion: Molecular dynamics and dislocation dynamics simulations. Journal of the Mechanics and Physics of Solids, 2010, 58, 1011-1025.	2.3	65
88	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.	2.3	8
89	Validity of classical nucleation theory for Ising models. Physical Review E, 2010, 81, 030601.	0.8	48
90	Role of surface roughness in hysteresis during adhesive elastic contact. Philosophical Magazine Letters, 2010, 90, 891-902.	0.5	63

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91	Synthesis and photoluminescence properties of hexagonal Lanthanide(iii)-doped NaYF ₄ microprisms. CrystEngComm, 2010, 12, 4263.	1.3	33
92	A gold-silicon potential fitted to the binary phase diagram. Journal of Physics Condensed Matter, 2010, 22, 055401.	0.7	17
93	Numerical tests of nucleation theories for the Ising models. Physical Review E, 2010, 82, 011603.	0.8	30
94	Orientation-Dependent Plasticity in Metal Nanowires under Torsion: Twist Boundary Formation and Eshelby Twist. Nano Letters, 2010, 10, 139-142.	4.5	56
95	Efficient computation of forces on dislocation segments in anisotropic elasticity. Modelling and Simulation in Materials Science and Engineering, 2010, 18, 045013.	0.8	30
96	Modelling dislocations in a free-standing thin film. Modelling and Simulation in Materials Science and Engineering, 2009, 17, 075007.	0.8	51
97	Energy of a Prismatic Dislocation Loop in an Elastic Cylinder. Mathematics and Mechanics of Solids, 2009, 14, 192-206.	1.5	12
98	Mechanics of Crystalline Nanowires. MRS Bulletin, 2009, 34, 178-183.	1.7	166
99	Large-Area Synthesis of High-Quality and Uniform Graphene Films on Copper Foils. Science, 2009, 324, 1312-1314.	6.0	10,000
100	Improved modified embedded-atom method potentials for gold and silicon. Modelling and Simulation in Materials Science and Engineering, 2009, 17, 075008.	0.8	40
101	Dislocation dynamics simulations in a cylinder. IOP Conference Series: Materials Science and Engineering, 2009, 3, 012007.	0.3	5
102	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.	2.3	36
103	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.	2.6	191
104	Synthesis and Solid-State NMR Structural Characterization of ¹³ C-Labeled Graphite Oxide. Science, 2008, 321, 1815-1817.	6.0	1,092
105	Comparison of thermal properties predicted by interatomic potential models. Modelling and Simulation in Materials Science and Engineering, 2008, 16, 085005.	0.8	45
106	Surface-controlled dislocation multiplication in metal micropillars. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 14304-14307.	3.3	201
107	Quantum entanglement of formation between qudits. Physical Review A, 2008, 77, .	1.0	14
108	Brittle and ductile fracture of semiconductor nanowires-molecular dynamics simulations. Philosophical Magazine, 2007, 87, 2169-2189.	0.7	136

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109	Synthesis and Photoluminescence Properties of Truncated Octahedral Eu-Doped YF ₃ Submicrocrystals or Nanocrystals. <i>Journal of Physical Chemistry C</i> , 2007, 111, 3241-3245.	1.5	91
110	Enabling strain hardening simulations with dislocation dynamics. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2007, 15, 553-595.	0.8	415
111	Computing image stress in an elastic cylinder. <i>Journal of the Mechanics and Physics of Solids</i> , 2007, 55, 2027-2054.	2.3	50
112	Electronic structure calculations in a uniform magnetic field using periodic supercells. <i>Journal of Computational Physics</i> , 2007, 226, 1310-1331.	1.9	7
113	Geometric aspects of the ideal shear resistance in simple crystal lattices. <i>Philosophical Magazine</i> , 2006, 86, 3847-3859.	0.7	13
114	Dislocation multi-junctions and strain hardening. <i>Nature</i> , 2006, 440, 1174-1178.	13.7	275
115	A non-singular continuum theory of dislocations. <i>Journal of the Mechanics and Physics of Solids</i> , 2006, 54, 561-587.	2.3	359
116	A hybrid method for computing forces on curved dislocations intersecting free surfaces in three-dimensional dislocation dynamics. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2006, 14, 1139-1151.	0.8	45
117	Computer Simulations of Dislocations. , 2006, , .		294
118	Nanohybrid Shish-Kebabs: Periodically Functionalized Carbon Nanotubes. <i>Advanced Materials</i> , 2005, 17, 1198-1202.	11.1	331
119	Adaptive importance sampling Monte Carlo simulation of rare transition events. <i>Journal of Chemical Physics</i> , 2005, 122, 074103.	1.2	7
120	Kinetic Monte Carlo method for dislocation migration in the presence of solute. <i>Physical Review B</i> , 2005, 71, .	1.1	10
121	Modeling Dislocations Using a Periodic Cell. , 2005, , 813-826.		1
122	Dynamic transitions from smooth to rough to twinning in dislocation motion. <i>Nature Materials</i> , 2004, 3, 158-163.	13.3	253
123	Mobility laws in dislocation dynamics simulations. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2004, 387-389, 277-281.	2.6	98
124	Dislocation Core Effects on Mobility. <i>Dislocations in Solids</i> , 2004, 12, 1-80.	1.6	120
125	Core energy and Peierls stress of a screw dislocation in bcc molybdenum: A periodic-cell tight-binding study. <i>Physical Review B</i> , 2004, 70, .	1.1	105
126	Ab Initio Calculations in a Uniform Magnetic Field Using Periodic Supercells. <i>Physical Review Letters</i> , 2004, 92, 186402.	2.9	21

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127	Title is missing!. Journal of Materials Science, 2003, 38, 3051-3054.	1.7	9
128	Modeling of dislocation-grain boundary interactions in FCC metals. Journal of Nuclear Materials, 2003, 323, 281-289.	1.3	143
129	Periodic image effects in dislocation modelling. Philosophical Magazine, 2003, 83, 539-567.	0.7	185
130	Anomalous Dislocation Multiplication in FCC Metals. Physical Review Letters, 2003, 91, 025503.	2.9	63
131	Nodal Effects in Dislocation Mobility. Physical Review Letters, 2002, 89, 115501.	2.9	53
132	Importance sampling of rare transition events in Markov processes. Physical Review E, 2002, 66, 046703.	0.8	20
133	Molecular dynamics simulations of motion of edge and screw dislocations in a metal. Computational Materials Science, 2002, 23, 111-115.	1.4	78
134	Kinetic Monte Carlo approach to modeling dislocation mobility. Computational Materials Science, 2002, 23, 124-130.	1.4	15
135	Dislocation motion in BCC metals by molecular dynamics. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2001, 309-310, 160-163.	2.6	62
136	Point defect interaction with dislocations in silicon. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2001, 309-310, 129-132.	2.6	9
137	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.	2.6	44
138	Synthesis of nano-AgI arrays and their optical properties. Journal of Materials Research, 2001, 16, 990-992.	1.2	38
139	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.	0.8	69
140	Anisotropic Elastic Interactions of a Periodic Dislocation Array. Physical Review Letters, 2001, 86, 5727-5730.	2.9	102
141	Intrinsic Mobility of a Dissociated Dislocation in Silicon. Physical Review Letters, 2000, 84, 3346-3349.	2.9	72
142	Minimizing Boundary Reflections in Coupled-Domain Simulations. Physical Review Letters, 2000, 85, 3213-3216.	2.9	202
143	Vacancy Interaction with Dislocations in Silicon: The Shuffle-Glide Competition. Physical Review Letters, 2000, 84, 2172-2175.	2.9	49
144	Efficient free-energy calculations by the simulation of nonequilibrium processes. Computing in Science and Engineering, 2000, 2, 88-96.	1.2	18

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145	Kinetic Monte Carlo method for dislocation glide in silicon. <i>Journal of Computer-Aided Materials Design</i> , 1999, 6, 175-183.	0.7	18
146	Dynamics of Dissociated Dislocations in Si: A Micro-Meso Simulation Methodology. <i>Materials Research Society Symposia Proceedings</i> , 1998, 538, 69.	0.1	5
147	Kink Asymmetry and Multiplicity in Dislocation Cores. <i>Physical Review Letters</i> , 1997, 79, 5042-5045.	2.9	53
148	Anisotropy of the reflectivity spectra of a BiSrCaCuO single crystal within the (001) plane. <i>Applied Physics Letters</i> , 1991, 58, 1098-1099.	1.5	4
149	Evaluation of the Surface Tension of Silicon-Gold Binary Liquid Alloy. <i>Materials Science Forum</i> , 0, 817, 772-777.	0.3	5