W Craig Carter

List of Publications by Year
in descending order

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136 papers	12,158 citations	31902 53 h-index	27345 106 g-index
179 all docs	179 docs citations	179 times ranked	11191 citing authors

#	Article	IF	Citations
1	Mechanism of Lithium Metal Penetration through Inorganic Solid Electrolytes. Advanced Energy Materials, 2017, 7, 1701003.	10.2	780
2	Mechanism and Kinetics of Li₂S Precipitation in Lithiumâ€“Sulfur Batteries. Advanced Materials, 2015, 27, 5203-5209.	11.1	704
3	Complexion: A new concept for kinetic engineering in materials science. Acta Materialia, 2007, 55, 6208-6218.	3.8	496
4	Semiâ€Solid Lithium Rechargeable Flow Battery. Advanced Energy Materials, 2011, 1, 511-516.	10.2	482
5	Towards High Power High Energy Aqueous Sodiumâ€Ion Batteries: The NaTi₂(PO₄)₃/Na_{0.44}MnO₂ System. Advanced Energy Materials, 2013, 3, 290-294.	10.2	430
6	Size-Dependent Lithium Miscibility Gap in Nanoscale Li[sub 1â^'x]FePO[sub 4]. Electrochemical and Solid-State Letters, 2007, 10, A134.	2.2	413
7	Strain Accommodation during Phase Transformations in Olivine-Based Cathodes as a Materials Selection Criterion for High-Power Rechargeable Batteries. Advanced Functional Materials, 2007, 17, 1115-1123.	7.8	394
8	A continuum model of grain boundaries. Physica D: Nonlinear Phenomena, 2000, 140, 141-150.	1.3	299
9	Extending phase field models of solidification to polycrystalline materials. Acta Materialia, 2003, 51, 6035-6058.	3.8	288
10	â€œElectrochemical Shockâ€•of Intercalation Electrodes: A Fracture Mechanics Analysis. Journal of the Electrochemical Society, 2010, 157, A1052.	1.3	274
11	Microstructural Modeling and Design of Rechargeable Lithium-Ion Batteries. Journal of the Electrochemical Society, 2005, 152, A255.	1.3	269
12	A review of wetting versus adsorption, complexions, and related phenomena: the rosetta stone of wetting. Journal of Materials Science, 2013, 48, 5681-5717.	1.7	238
13	Simulations of microstructural evolution: anisotropic growth and coarsening. Physica A: Statistical Mechanics and Its Applications, 1998, 261, 232-247.	1.2	217
14	Diffuse interface model for structural transitions of grain boundaries. Physical Review B, 2006, 73, .	1.1	208
15	Polysulfide Flow Batteries Enabled by Percolating Nanoscale Conductor Networks. Nano Letters, 2014, 14, 2210-2218.	4.5	201
16	OOF: an image-based finite-element analysis of material microstructures. Computing in Science and Engineering, 2001, 3, 15-23.	1.2	197
17	Modeling of internal mechanical failure of all-solid-state batteries during electrochemical cycling, and implications for battery design. Journal of Materials Chemistry A, 2017, 5, 19422-19430.	5.2	191
18	Vector-valued phase field model for crystallization and grain boundary formation. Physica D: Nonlinear Phenomena, 1998, 119, 415-423.	1.3	182

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19	A binary model of textile compositesâ€”I. Formulation. Acta Metallurgica Et Materialia, 1994, 42, 3463-3479.	1.9	181
20	Simultaneous grain boundary migration and grain rotation. Acta Materialia, 2006, 54, 1707-1719.	3.8	173
21	Lithium Metal Penetration Induced by Electrodeposition through Solid Electrolytes: Example in Single-Crystal Li₆La₃ZrTaO₁₂Garnet. Journal of the Electrochemical Society, 2018, 165, A3648-A3655.	1.3	172
22	New software tools for the calculation and display of isolated and attached interfacial-energy minimizing particle shapes. Journal of Materials Science, 2012, 47, 8290-8302.	1.7	168
23	Grain Boundary Transitions in Binary Alloys. Physical Review Letters, 2006, 97, 075502.	2.9	165
24	Electrochemically Driven Phase Transitions in Insertion Electrodes for Lithium-Ion Batteries: Examples in Lithium Metal Phosphate Olivines. Annual Review of Materials Research, 2010, 40, 501-529.	4.3	151
25	Design criteria for electrochemical shock resistant battery electrodes. Energy and Environmental Science, 2012, 5, 8014.	15.6	146
26	Model for the Particle Size, Overpotential, and Strain Dependence of Phase Transition Pathways in Storage Electrodes: Application to Nanoscale Olivines. Chemistry of Materials, 2009, 21, 1557-1571.	3.2	144
27	Reversible Aluminumâ€Ion Intercalation in Prussian Blue Analogs and Demonstration of a Highâ€Power Aluminumâ€Ion Asymmetric Capacitor. Advanced Energy Materials, 2015, 5, 1401410.	10.2	142
28	Shape evolution by surface diffusion and surface attachment limited kinetics on completely faceted surfaces. Acta Metallurgica Et Materialia, 1995, 43, 4309-4323.	1.9	138
29	Equilibrium Shape of Internal Cavities in Sapphire. Journal of the American Ceramic Society, 1997, 80, 62-68.	1.9	137
30	Electrochemically Induced Phase Transformation in Nanoscale Olivines Li_{1â^’x}MPO₄ (M = Fe, Mn). Chemistry of Materials, 2008, 20, 6189-6198.	3.2	121
31	Residualâ€Stress Predictions in Polycrystalline Alumina. Journal of the American Ceramic Society, 2001, 84, 2947-2954.	1.9	117
32	Aqueous semi-solid flow cell: demonstration and analysis. Physical Chemistry Chemical Physics, 2013, 15, 15833.	1.3	112
33	Overpotential-Dependent Phase Transformation Pathways in Lithium Iron Phosphate Battery Electrodes. Chemistry of Materials, 2010, 22, 5845-5855.	3.2	109
34	The Effect of Stress on Battery-Electrode Capacity. Journal of the Electrochemical Society, 2017, 164, A645-A654.	1.3	109
35	Phase diagram and low-temperature behavior of oxygen ordering inYBa2Cu3Ozusingab initiointeractions. Physical Review B, 1990, 41, 8698-8701.	1.1	102
36	A binary model of textile compositesâ€”II. The elastic regime. Acta Metallurgica Et Materialia, 1995, 43, 3511-3524.	1.9	97

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37	Wulffman: A tool for the calculation and display of crystal shapes. Computational Materials Science, 1998, 11, 16-26.	1.4	91
38	Effects of Interface Roughness on Residual Stresses in Thermal Barrier Coatings. Journal of the American Ceramic Society, 1999, 82, 1073-1075.	1.9	88
39	Exploring for 3D photonic bandgap structures in the 11 f.c.c. space groups. Nature Materials, 2003, 2, 664-667.	13.3	87
40	Maximizing Energetic Efficiency in Flow Batteries Utilizing Non-Newtonian Fluids. Journal of the Electrochemical Society, 2014, 161, A486-A496.	1.3	83
41	The forces and behavior of fluids constrained by solids. Acta Metallurgica, 1988, 36, 2283-2292.	2.1	81
42	Interplay of Sintering Microstructures, Driving Forces, and Mass Transport Mechanisms. Journal of the American Ceramic Society, 1989, 72, 1550-1555.	1.9	79
43	Comparative Study of Lithium Transport Kinetics in Olivine Cathodes for Li-ion Batteries. Chemistry of Materials, 2010, 22, 1088-1097.	3.2	79
44	Semi-solid alkali metal electrodes enabling high critical current densities in solid electrolyte batteries. Nature Energy, 2021, 6, 314-322.	19.8	78
45	Surface formulation for molecular interactions of macroscopic bodies. Journal of the Mechanics and Physics of Solids, 1997, 45, 1161-1183.	2.3	76
46	Nanomechanical Quantification of Elastic, Plastic, and Fracture Properties of LiCoO₂. Advanced Energy Materials, 2012, 2, 940-944.	10.2	74
47	Solvent Effects on Polysulfide Redox Kinetics and Ionic Conductivity in Lithium-Sulfur Batteries. Journal of the Electrochemical Society, 2016, 163, A3111-A3116.	1.3	74
48	Modeling the hydrodynamic and electrochemical efficiency of semi-solid flow batteries. Electrochimica Acta, 2012, 69, 301-307.	2.6	73
49	Mechanical instability of electrode-electrolyte interfaces in solid-state batteries. Physical Review Materials, 2018, 2, .	0.9	69
50	Thermodynamically consistent variational principles with applications to electrically and magnetically active systems. Acta Materialia, 2004, 52, 11-21.	3.8	62
51	Numerical methods for computing interfacial mean curvature. Computational Materials Science, 1995, 4, 103-116.	1.4	60
52	Variational methods for microstructural-evolution theories. Jom, 1997, 49, 30-36.	0.9	55
53	Grain boundary order-disorder transitions. Journal of Materials Science, 2006, 41, 7691-7695.	1.7	55
54	Damage evolution during microcracking of brittle solids. Acta Materialia, 2001, 49, 127-137.	3.8	53

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55	Electrochemical Shock in Ion-Intercalation Materials with Limited Solid-Solubility. Journal of the Electrochemical Society, 2013, 160, A1286-A1292.	1.3	52
56	Thermodynamic phase-field model for microstructure with multiple components and phases: The possibility of metastable phases. Physical Review E, 2011, 83, 061602.	0.8	51
57	Modeling grain boundaries using a phase-field technique. Journal of Crystal Growth, 2000, 211, 18-20.	0.7	48
58	Numerical Analysis of the Shapes and Energies of Droplets on Micropatterned Substrates. Langmuir, 2006, 22, 4237-4243.	1.6	46
59	Formulation of the coupled electrochemicalâ€“mechanical boundary-value problem, with applications to transport of multiple charged species. Acta Materialia, 2016, 104, 33-51.	3.8	44
60	Modeling the competing phase transition pathways in nanoscale olivine electrodes. Electrochimica Acta, 2010, 56, 969-976.	2.6	43
61	Pressure-balance and diffuse-interface models for surficial amorphous films. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2006, 422, 19-28.	2.6	41
62	A model for solid-state dewetting of a fully-faceted thin film. Comptes Rendus Physique, 2013, 14, 564-577.	0.3	41
63	A low-dissipation, pumpless, gravity-induced flow battery. Energy and Environmental Science, 2016, 9, 1760-1770.	15.6	39
64	A phase field model of the impingement of solidifying particles. Physica A: Statistical Mechanics and Its Applications, 1998, 261, 159-166.	1.2	38
65	Continuum modelling and representations of interfaces and their transitions in materials. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2006, 422, 102-114.	2.6	38
66	Chemomechanics of ionically conductive ceramics for electrical energy conversion and storage. Journal of Electroceramics, 2014, 32, 3-27.	0.8	38
67	Impact of the Ga Droplet Wetting, Morphology, and Pinholes on the Orientation of GaAs Nanowires. Crystal Growth and Design, 2016, 16, 5781-5786.	1.4	38
68	Faceting and Wetting Transitions of Anisotropic Interfaces and Grain Boundaries. Journal of the American Ceramic Society, 1999, 82, 1889-1900.	1.9	37
69	Validation of the effective-medium approximation for the dielectric permittivity of oriented nanoparticle-filled materials: effective permittivity for dielectric nanoparticles in multilayer photonic composites. Applied Physics B: Lasers and Optics, 2003, 76, 877-884.	1.1	37
70	Cellular automaton algorithm for surface mass transport due to curvature gradients simulations of sintering. Computational Materials Science, 1992, 1, 63-77.	1.4	35
71	Analytical and numerical analyses for two-dimensional stress transfer. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1999, 268, 1-7.	2.6	34
72	The Effect of Texture and Microstructure on the Macroscopic Properties of Polycrystalline Piezoelectrics: Application to Barium Titanate and PZN-PT. Journal of the American Ceramic Society, 2005, 88, 750-757.	1.9	34

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73	Electroactive-Zone Extension in Flow-Battery Stacks. Electrochimica Acta, 2014, 147, 460-469.	2.6	34
74	Quantitative analysis of anisotropic edge retraction by solid-state dewetting of thin single crystal films. Journal of Applied Physics, 2013, 113, .	1.1	33
75	Stability of multilayer structures: Capillary effects. Scripta Materialia, 1999, 12, 387-390.	0.5	31
76	The Wulff Shape of Alumina: I, Modeling the Kinetics of Morphological Evolution. Journal of the American Ceramic Society, 2000, 83, 2561-2531.	1.9	31
77	Spreading of metallic drops. Nature Materials, 2004, 3, 843-845.	13.3	29
78	A diffuse interface model of interfaces: Grain boundaries in silicon nitride. Acta Materialia, 2005, 53, 4755-4764.	3.8	29
79	The morphological stability of continuous intergranular phases: Thermodynamic considerations. Acta Metallurgica, 1987, 35, 237-245.	2.1	28
80	Transient subcritical crack-growth behavior in transformation-toughened ceramics. Acta Metallurgica Et Materialia, 1990, 38, 2327-2336.	1.9	28
81	Computation and simulation of reliability parameters and their variations in heterogeneous materials. Acta Materialia, 2000, 48, 3593-3605.	3.8	27
82	Relating atomistic grain boundary simulation results to the phase-field model. Computational Materials Science, 2002, 25, 378-386.	1.4	26
83	Ionic colloidal crystals: Ordered, multicomponent structures via controlled heterocoagulation. Physical Review E, 2006, 73, 011402.	0.8	25
84	The equilibrium shape of anisotropic interfacial particles. Philosophical Magazine, 2004, 84, 991-1010.	0.7	24
85	Effect of charge separation on the stability of large wavelength fluctuations during spinodal decomposition. Acta Materialia, 2003, 51, 1517-1524.	3.8	23
86	Random Walk Analysis of the Effect of Mechanical Degradation on All-Solid-State Battery Power. Journal of the Electrochemical Society, 2017, 164, A2660-A2664.	1.3	19
87	Three-dimensional dielectric network structures with large photonic band gaps. Applied Physics Letters, 2003, 83, 5172-5174.	1.5	18
88	Mesoscopic Phase Transition Kinetics in Secondary Particles of Electrode-Active Materials in Lithium-Ion Batteries. Chemistry of Materials, 2018, 30, 4216-4225.	3.2	18
89	Controlled and rapid ordering of oppositely charged colloidal particles. Journal of Colloid and Interface Science, 2009, 333, 230-236.	5.0	17
90	Strategies to Avert Electrochemical Shock and Their Demonstration in Spinels. Journal of the Electrochemical Society, 2014, 161, F3005-F3009.	1.3	17

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91	The mechanism of corner instabilities in single-crystal thin films during dewetting. Journal of Applied Physics, 2016, 119, .	1.1	17
92	Branching Mechanisms in Surfactant Micellar Growth. Journal of Physical Chemistry B, 2013, 117, 2898-2905.	1.2	16
93	Wetting in Multiphase Systems with Complex Geometries. Journal of Materials Science, 2001, 9, 191-197.	1.2	14
94	High-strength all-solid lithium ion electrodes based on Li4Ti5O12. Journal of Power Sources, 2011, 196, 6507-6511.	4.0	14
95	Combining phase-field crystal methods with a Cahn-Hilliard model for binary alloys. Physical Review E, 2018, 97, 043304.	0.8	14
96	Diminished normal reflectivity of one-dimensional photonic crystals due to dielectric interfacial roughness. Optics Letters, 2004, 29, 2791.	1.7	13
97	Percolation of diffusionally evolved two-phase systems. Physical Review E, 2011, 83, 021119.	0.8	13
98	The effect of finite amplitude perturbations on the stability of continuous phases. Materials Science and Engineering, 1987, 89, L41-L45.	0.1	11
99	The Stability of Several Triply Periodic Surfaces. Journal of Materials Science, 2002, 10, 287-296.	1.2	11
100	Gemini: Engaging Experiential and Feature Scales Through Multimaterial Digital Design and Hybrid Additiveâ€“Subtractive Fabrication. 3D Printing and Additive Manufacturing, 2014, 1, 108-114.	1.4	11
101	Capillary Instability in Nanowire Geometries. Nano Letters, 2014, 14, 3577-3581.	4.5	11
102	Morphology of grain growth in response to diffusion induced elastic stresses: cubic systems. Acta Metallurgica Et Materialia, 1993, 41, 1633-1642.	1.9	10
103	Interplay of capillary and elastic driving forces during microstructural evolution: Applications of a digital image model. Journal of Applied Physics, 1998, 83, 4477-4486.	1.1	10
104	The effect of interfacial roughness on the normal incidence bandgap of one-dimensional photonic crystals. Optics Express, 2005, 13, 8380.	1.7	10
105	Phase-field model for diffusion-induced grain boundary migration: An application to battery electrodes. Physical Review Materials, 2019, 3, .	0.9	10
106	Dihedral Angle Effects on the Stability of Pore Channels. Journal of the American Ceramic Society, 1984, 67, C-124-C-127.	1.9	9
107	Orientation-dependent surface tension functions for surface energy minimizing calculations. Journal of Materials Science, 2005, 40, 3107-3113.	1.7	9
108	Questioning liquid droplet stability on nanowire tips: from theory to experiment. Nanotechnology, 2019, 30, 285604.	1.3	9

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109	Finite Element Implementation of a Thermodynamic Description of Piezoelectric Microstructures. Journal of the American Ceramic Society, 2005, 88, 742-749.	1.9	8
110	Templated self-assembly of non-close-packed colloidal crystals: Toward diamond cubic and novel heterostructures. Journal of Materials Research, 2011, 26, 247-253.	1.2	8
111	Possible Explanations of Transient Neck Formation between Pairs of (100) Faceted Particles. Journal of the American Ceramic Society, 1996, 79, 2443-2451.	1.9	7
112	Nanometer-Scale Wetting of the Silicon Surface by Its Equilibrium Oxide. Langmuir, 2008, 24, 1891-1896.	1.6	7
113	Shape-controlled nanopores in single crystals. Nanotechnology, 2010, 21, 475301.	1.3	7
114	Power-law scaling regimes for solid-state dewetting of thin films. Scripta Materialia, 2016, 116, 143-146.	2.6	7
115	Heterotwin Zn₃P₂superlattice nanowires: the role of indium insertion in the superlattice formation mechanism and their optical properties. Nanoscale, 2020, 12, 22534-22540.	2.8	7
116	A stochastic model of damage accumulation in complex microstructures. Journal of Materials Science, 2005, 40, 3993-4004.	1.7	6
117	Four questions about triple lines. Scripta Materialia, 2010, 62, 894-898.	2.6	6
118	Experimental verification of the applicability of the homogenization approximation to rough one-dimensional photonic crystals using a holographically fabricated reflection grating. Journal of Applied Physics, 2006, 100, 066103.	1.1	5
119	Mesoscale Model for Ostwald Ripening of Catalyst Nanoparticles. Journal of the Electrochemical Society, 2021, 168, 054515.	1.3	5
120	Application of the homogenization approximation to rough one-dimensional photonic crystals. Optics Letters, 2005, 30, 2930.	1.7	4
121	The genetics of grain boundaries. Nature Materials, 2010, 9, 383-385.	13.3	4
122	Quantifying reliability statistics for electrochemical shock of brittle materials. Journal of the Mechanics and Physics of Solids, 2014, 70, 71-83.	2.3	4
123	A simple model of fully-faceted grain growth and coarsening with non-linear growth laws. International Journal of Materials Research, 2005, 96, 124-134.	0.8	3
124	Simulating Infiltration as a Sequence of Pinning and De-pinning Processes. Acta Materialia, 2021, 210, 116831.	3.8	3
125	Modeling Particle Size Effects on Phase Stability and Transition Pathways in Nanosized Olivine Cathode Particles. Materials Research Society Symposia Proceedings, 2008, 1100, 3041.	0.1	2
126	Cross-disciplinary molecular science education in introductory science courses. , 2008, , .		2

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127	Self-ordering mechanism of nanocluster-chain on the functional vicinal surfaces. Applied Physics Letters, 2009, 95, 253110.	1.5	2
128	Microstructural Modeling of Multifunctional Material Properties: The OOF Project. , 2005, , 573-587.		1
129	Phase Behavior of Nanoscale Intercalation Compounds and Impact on Electrochemical Properties. ECS Meeting Abstracts, 2009, , .	0.0	1
130	Growth of nanowire arrays from micron-feature templates. Nanotechnology, 2019, 30, 285302.	1.3	1
131	Metallic Island Coalescence: Molecular Dynamics Simulations of Boundary Formation and Tensile Strain in Polycrystalline Thin Films. Materials Research Society Symposia Proceedings, 2003, 779, 451.	0.1	1
132	Percolation of Diffusionally Evolved Two-Phase Systems. Materials Research Society Symposia Proceedings, 2007, 1059, 1.	0.1	0
133	Instruction Online: Core Components for Re-Use. ACS Symposium Series, 2010, , 235-262.	0.5	0
134	Micro-mechanics in Electrochemical Systems. , 2018, , 1-54.		0
135	The 7th International Workshop on Interfaces: New Materials via Interfacial Control. International Journal of Materials Research, 2010, 101, 7-7.	0.1	0
136	Micro-mechanics in Electrochemical Systems. , 2019, , 901-953.		0