Michael L Falk

List of Publications by Year
in descending order

104 papers	6,803 citations	94433 37 h-index	58581 82 g-index
106 all docs	106 docs citations	106 times ranked	4143 citing authors

#	Article	IF	Citations
1	Dynamics of viscoplastic deformation in amorphous solids. Physical Review E, 1998, 57, 7192-7205.	2.1	1,749
2	Deformation of metallic glasses: Recent developments in theory, simulations, and experiments. Acta Materialia, 2016, 109, 375-393.	7.9	400
3	Soft spots and their structural signature in a metallic glass. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 14052-14056.	7.1	348
4	Deformation and Failure of Amorphous, Solidlike Materials. Annual Review of Condensed Matter Physics, 2011, 2, 353-373.	14.5	296
5	Strain Localization and Percolation of Stable Structure in Amorphous Solids. Physical Review Letters, 2005, 95, 095502.	7.8	258
6	Elastostatically induced structural disordering in amorphous alloys. Acta Materialia, 2008, 56, 5440-5450.	7.9	191
7	Molecular-dynamics study of ductile and brittle fracture in model noncrystalline solids. Physical Review B, 1999, 60, 7062-7070.	3.2	172
8	Evaluation of the Disorder Temperature and Free-Volume Formalisms via Simulations of Shear Banding in Amorphous Solids. Physical Review Letters, 2007, 98, 185505.	7.8	160
9	Atomic-scale simulations of strain localization in three-dimensional model amorphous solids. Physical Review B, 2006, 73, .	3.2	154
10	Stress-induced structural transformation and shear banding during simulated nanoindentation of a metallic glass. Acta Materialia, 2007, 55, 4317-4324.	7.9	140
11	Connecting Local Yield Stresses with Plastic Activity in Amorphous Solids. Physical Review Letters, 2016, 117, 045501.	7.8	137
12	Interactions between charged spherical macroions. Journal of Chemical Physics, 1996, 104, 5209-5219.	3.0	125
13	Predicting plasticity in disordered solids from structural indicators. Physical Review Materials, 2020, 4, .	2.4	112
14	Thermal effects in the shear-transformation-zone theory of amorphous plasticity: Comparisons to metallic glass data. Physical Review E, 2004, 70, 011507.	2.1	104
15	Dynamic precipitation and recrystallization in Mg-9wt.%Al during equal-channel angular extrusion: A comparative study to conventional aging. Acta Materialia, 2019, 172, 185-199.	7.9	99
16	Sliding behavior of metallic glass. Wear, 2001, 250, 409-419.	3.1	88
17	Sliding behavior of metallic glass. Wear, 2001, 250, 420-430.	3.1	87
18	Examples of structural evolution during sliding and shear of ductile materials. Scripta Materialia, 2003, 49, 977-983.	5.2	85

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19	Promoting sulfur adsorption using surface Cu sites in metalâ€“organic frameworks for lithium sulfur batteries. Journal of Materials Chemistry A, 2018, 6, 4811-4821.	10.3	85
20	An energy basin finding algorithm for kinetic Monte Carlo acceleration. Journal of Chemical Physics, 2010, 132, 134104.	3.0	83
21	Does metallic glass have a backbone? The role of percolating short range order in strength and failure. Scripta Materialia, 2006, 54, 381-386.	5.2	79
22	Structural transformation and localization during simulated nanoindentation of a noncrystalline metal film. Applied Physics Letters, 2005, 86, 011914.	3.3	77
23	Cavitation in Amorphous Solids. Physical Review Letters, 2013, 110, 185502.	7.8	75
24	Local yield stress statistics in model amorphous solids. Physical Review E, 2018, 97, 033001.	2.1	67
25	From Simulation to Theory in the Physics of Deformation and Fracture. MRS Bulletin, 2000, 25, 40-45.	3.5	58
26	Ion Dependence of Gate Dielectric Behavior of Alkali Metal Ion-Incorporated Aluminas in Oxide Field-Effect Transistors. Chemistry of Materials, 2013, 25, 3788-3796.	6.7	58
27	A computational analysis of the deformation mechanisms of a nanocrystalâ€“metallic glass composite. Acta Materialia, 2008, 56, 995-1000.	7.9	55
28	Structural disordering process of an amorphous alloy driven by the elastostatic compression at room temperature. Applied Physics Letters, 2008, 92, .	3.3	55
29	Predicting Shear Transformation Events in Metallic Glasses. Physical Review Letters, 2018, 120, 125503.	7.8	52
30	Shear softening and structure in a simulated three-dimensional binary glass. Journal of Chemical Physics, 2005, 122, 154508.	3.0	50
31	Tribological behavior of WC/DLC/WS2 nanocomposite coatings. Surface and Coatings Technology, 2004, 188-189, 605-611.	4.8	48
32	Sliding and deformation of metallic glass: experiments and MD simulations. Journal of Non-Crystalline Solids, 2003, 317, 206-214.	3.1	47
33	Simulating the mechanical response of amorphous solids using atomistic methods. European Physical Journal B, 2010, 75, 405-413.	1.5	46
34	Interdiffusion of Ni-Al multilayers: A continuum and molecular dynamics study. Journal of Applied Physics, 2013, 114, .	2.5	44
35	Atomic-scale simulations on the sliding of incommensurate surfaces: The breakdown of superlubricity. Physical Review B, 2009, 80, .	3.2	43
36	Nanostructures generated by explosively driven friction: Experiments and molecular dynamics simulations. Acta Materialia, 2009, 57, 5270-5282.	7.9	42

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37	MD Simulations of Microstructure Evolution during High-Velocity Sliding between Crystalline Materials. Tribology Letters, 2007, 28, 299-306.	2.6	40
38	Tribochemical Wear of Diamond-Like Carbon-Coated Atomic Force Microscope Tips. ACS Applied Materials & Interfaces, 2017, 9, 35341-35348.	8.0	39
39	Coarse graining atomistic simulations of plastically deforming amorphous solids. Physical Review E, 2017, 95, 053001.	2.1	38
40	Introducing Discipline-Based Computing in Undergraduate Engineering Education. ACM Transactions on Computing Education, 2013, 13, 1-22.	3.5	37
41	A case study of undergraduate engineering students' computational literacy and self-beliefs about computing in the context of authentic practices. Computers in Human Behavior, 2016, 61, 427-442.	8.5	36
42	Shear localization and the plasticity of bulk amorphous alloys. Scripta Materialia, 2010, 63, 231-234.	5.2	33
43	Multibond Model of Single-Asperity Tribochemical Wear at the Nanoscale. ACS Applied Materials & Interfaces, 2017, 9, 35333-35340.	8.0	33
44	Length-scale dependence of elastic strain from scattering measurements in metallic glasses. Physical Review B, 2012, 85, .	3.2	31
45	Writing In-Code Comments to Self-Explain in Computational Science and Engineering Education. ACM Transactions on Computing Education, 2017, 17, 1-21.	3.5	31
46	The Flow of Glass. Science, 2007, 318, 1880-1881.	12.6	29
47	Bayesian Inference of Atomic Diffusivity in a Binary Ni/Al System Based on Molecular Dynamics. Multiscale Modeling and Simulation, 2011, 9, 486-512.	1.6	29
48	The continuum elastic and atomistic viewpoints on the formation volume and strain energy of a point defect. Journal of the Mechanics and Physics of Solids, 2006, 54, 1929-1951.	4.8	25
49	Atomistic simulation of solid solution hardening in Mg/Al alloys: Examination of composition scaling and thermo-mechanical relationships. Acta Materialia, 2016, 105, 378-389.	7.9	24
50	Student Explanations in the Context of Computational Science and Engineering Education. Cognition and Instruction, 2019, 37, 201-231.	2.9	24
51	Relating metallic glass mechanical properties to liquid structure. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2004, 375-377, 671-674.	5.6	23
52	Tribological characteristics of diamond-like carbon (DLC) based nanocomposite coatings. Wear, 2005, 259, 744-751.	3.1	22
53	ZT > 0.1 Electronâ€Carrying Polymer Thermoelectric Composites with In Situ SnCl₂ Microstructure Growth. Advanced Science, 2015, 2, 1500015.	11.2	22
54	Simulations of nanoindentation in a thin amorphous metal film. Thin Solid Films, 2007, 515, 3179-3182.	1.8	20

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55	Role of intermediate states in low-velocity friction between amorphous surfaces. Physical Review B, 2011, 84, .	3.2	20
56	Affordances and challenges of computational tools for supporting modeling and simulation practices. Computer Applications in Engineering Education, 2017, 25, 352-375.	3.4	20
57	Shear band broadening in simulated glasses. Physical Review E, 2018, 98, .	2.1	20
58	Amorphous ZnO-Based Compounds as Thermoelectrics. Journal of Physical Chemistry C, 2016, 120, 2529-2535.	3.1	19
59	Critical Analysis of an FeP Empirical Potential Employed to Study the Fracture of Metallic Glasses. Physical Review Letters, 2019, 122, 035501.	7.8	19
60	Paradoxical phenomena between the homogeneous and inhomogeneous deformations of metallic glasses. Applied Physics Letters, 2009, 94, 021907.	3.3	18
61	Strain-dependent activation energy of shear transformation in metallic glasses. Physical Review B, 2017, 95, .	3.2	18
62	Characterizing the interplay of cognitive and metacognitive knowledge in computational modeling and simulation practices. Journal of Engineering Education, 2019, 108, 276-303.	3.0	18
63	Multiscale diffusion Monte Carlo simulation of epitaxial growth. Journal of Computational Physics, 2006, 217, 519-529.	3.8	17
64	Deformation assisted nucleation of continuous nanoprecipitates in Mgâ€“Al alloys. Materialia, 2020, 9, 100583.	2.7	17
65	Modeling low energy sputtering of hexagonal boron nitride by xenon ions. Journal of Applied Physics, 2008, 104, .	2.5	16
66	Elastic effects on relaxation volume tensor calculations. Physical Review B, 2008, 77, .	3.2	16
67	Calculations of the thermodynamic and kinetic properties of Li<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:msub><mml:mrow /><mml:mrow><mml:mn>1</mml:mn><mml:mo>+</mml:mo><mml:mi>x</mml:mi></mml:mrow></mml:msub></mml:math>V<mml:m xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:msub><mml:mrow /><mml:mn>3</mml:mn></mml:msub></mml:math>O<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:msub><mml:mrow /><mml:	3.2	16
68	Oscillating magnetization of quantum wells and wires in tilted magnetic fields. Physical Review B, 1992, 46, 15530-15533.	3.2	15
69	Solute softening and defect generation during prismatic slip in magnesium alloys. Modelling and Simulation in Materials Science and Engineering, 2017, 25, 085001.	2.0	14
70	Medium range order and the radial distribution function. Journal of Non-Crystalline Solids, 2006, 352, 116-122.	3.1	13
71	Atomic nonaffinity as a predictor of plasticity in amorphous solids. Physical Review Materials, 2021, 5, .	2.4	13
72	Interface localized states in coupled superlattices. Journal of Applied Physics, 1992, 72, 5325-5328.	2.5	12

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73	Electronic structure of the triangular quantum well in a tilted magnetic field. Physica B: Condensed Matter, 1993, 184, 318-322.	2.7	12
74	Spatial nonuniformity in heat transport across hybrid material interfaces. Physical Review B, 2014, 90, .	3.2	12
75	A small-gap effective-temperature model of transient shear band formation during flow. Journal of Rheology, 2016, 60, 873-882.	2.6	12
76	The effect of island density on pit nucleation in In0.27Ga0.73As/GaAs films. Surface Science, 2003, 525, 222-228.	1.9	11
77	Pit nucleation in the presence of three-dimensional islands during heteroepitaxial growth. Physical Review B, 2004, 70, .	3.2	11
78	Intermetallic formation at deeply supercooled Ni/Al multilayer interfaces: A molecular dynamics study. Journal of Applied Physics, 2018, 124, .	2.5	11
79	Strengthening magnesium by design: Integrating alloying and dynamic processing. Mechanics of Materials, 2022, 167, 104203.	3.2	11
80	Suppression of homogeneous crystal nucleation of the NiAl intermetallic by a composition gradient: A molecular dynamics study. Journal of Chemical Physics, 2017, 146, .	3.0	10
81	Thermally activated twin thickening and solute softening in magnesium alloys - a molecular simulation study. Scripta Materialia, 2019, 162, 195-199.	5.2	10
82	Predicting plastic events and quantifying the local yield surface in 3D model glasses. Journal of the Mechanics and Physics of Solids, 2022, 158, 104671.	4.8	10
83	Recrystallization mechanisms, grain refinement, and texture evolution during ECAE processing of Mg and its alloys. Mechanics of Materials, 2021, 162, 104067.	3.2	10
84	Manifold learning for coarse-graining atomistic simulations: Application to amorphous solids. Acta Materialia, 2021, 215, 117008.	7.9	9
85	Symmetry-dependent localization in a finite superlattice. Physical Review B, 1992, 46, 9564-9568.	3.2	8
86	Multiphysics Simulations of Lithiation-Induced Stress in Li_{1+<i>x</i>}Ti₂O₄ Electrode Particles. Journal of Physical Chemistry C, 2016, 120, 27871-27881.	3.1	8
87	Strategic control of atomic-scale defects for tuning properties in metals. Nature Reviews Physics, 2021, 3, 148-149.	26.6	8
88	Quantum wire in a longitudinal magnetic field: Effect of quantum confinement on magnetization. Physical Review B, 1992, 46, 15270-15273.	3.2	7
89	Undergraduate Engineering Studentsâ€™ Types and Quality of Knowledge Used in Synthetic Modeling. Cognition and Instruction, 2020, 38, 503-537.	2.9	7
90	A practical perspective on the implementation of hyperdynamics for accelerated simulation. Journal of Chemical Physics, 2014, 140, 044107.	3.0	6

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91	Investigation of localization in an infinite superlattice. Superlattices and Microstructures, 1992, 12, 159-161.	3.1	4
92	Predicting the Rate of Homogeneous Intermetallic Nucleation within Steep Composition Gradients. Journal of Physical Chemistry C, 2020, 124, 23807-23814.	3.1	3
93	Deformation Assisted Nucleation of Continuous Nanoprecipitates in Mg-Al Alloys. SSRN Electronic Journal, 0, , .	0.4	3
94	Strain Localization in a Molecular-Dynamics Model of a Metallic Glass. Materials Research Society Symposia Proceedings, 2002, 754, 1.	0.1	2
95	Accelerated Molecular Dynamics Simulation of AFM Experiments Using the Bond-Boost Method. Materials Research Society Symposia Proceedings, 2008, 1085, 20201.	0.1	2
96	Materials Science Studentsâ€™ Perceptions and Usage Intentions of Computation. , 0, , .		2
97	Experimental Studies and Molecular Dynamics Simulations of the Sliding Contact of Metallic Glass. Materials Research Society Symposia Proceedings, 2000, 644, 181.	0.1	1
98	Atomic-scale simulations of strain localization in a single-component three-dimensional model amorphous solid. Materials Research Society Symposia Proceedings, 2005, 903, 1.	0.1	1
99	The Thermal Shear-Transformation-Zone Theory: Homogeneous Flow and Superplasticity in Bulk Metallic Glasses. Materials Research Society Symposia Proceedings, 2003, 806, 262.	0.1	0
100	Pit nucleation in compound semiconductor thin films. Materials Research Society Symposia Proceedings, 2003, 794, 82.	0.1	0
101	AtomLab: A tool for teaching materials science and simulation on the atomic scale. Materials Research Society Symposia Proceedings, 2004, 827, 261.	0.1	0
102	Teaching The Molecular Simulation Of Materials To A Diverse Cross Section Of Engineering Graduate Students. , 0, , .		0
103	Student Driven Engineering Design Projects. , 0, , .		0
104	TITLE: Rethinking the Gateway Computing Curriculum Across Engineering Disciplines. , 0, , .		0