Brad L Boyce

List of Publications by Year
in descending order

147 papers	5,599 citations	57719 44 h-index	91828 69 g-index
152 all docs	152 docs citations	152 times ranked	4493 citing authors

#	Article	IF	Citations
1	Slip planes in bcc transition metals. International Materials Reviews, 2013, 58, 296-314.	9.4	234
2	Effect of load ratio and maximum stress intensity on the fatigue threshold in Tiâ€"6Alâ€"4V. Engineering Fracture Mechanics, 2001, 68, 129-147.	2.0	191
3	A Review of Fatigue Behavior in Nanocrystalline Metals. Experimental Mechanics, 2010, 50, 5-23.	1.1	163
4	Full-field deformation of bovine cornea under constrained inflation conditions. Biomaterials, 2008, 29, 3896-3904.	5.7	155
5	Additive manufacturing: Toward holistic design. Scripta Materialia, 2017, 135, 141-147.	2.6	144
6	Grain-scale experimental validation of crystal plasticity finite element simulations of tantalum oligocrystals. International Journal of Plasticity, 2014, 60, 1-18.	4.1	140
7	Thresholds for high-cycle fatigue in a turbine engine Tiâ€"6Alâ€"4V alloy. International Journal of Fatigue, 1999, 21, 653-662.	2.8	125
8	The residual stress state due to a spherical hard-body impact. Mechanics of Materials, 2001, 33, 441-454.	1.7	125
9	High-cycle fatigue of Ti-6Al-4V. Fatigue and Fracture of Engineering Materials and Structures, 1999, 22, 621-631.	1.7	119
10	Stress-controlled viscoelastic tensile response of bovine cornea. Journal of Biomechanics, 2007, 40, 2367-2376.	0.9	118
11	High-throughput stochastic tensile performance of additively manufactured stainless steel. Journal of Materials Processing Technology, 2017, 241, 1-12.	3.1	118
12	The mechanisms of ductile rupture. Acta Materialia, 2018, 161, 83-98.	3.8	118
13	The Sandia Fracture Challenge: blind round robin predictions of ductile tearing. International Journal of Fracture, 2014, 186, 5-68.	1.1	115
14	Fracture strength of micro- and nano-scale silicon components. Applied Physics Reviews, 2015, 2, .	5.5	96
15	The dynamic tensile behavior of tough, ultrahigh-strength steels at strain-rates from 0.0002sâ^'1 to 200sâ^'1. International Journal of Impact Engineering, 2009, 36, 263-271.	2.4	90
16	On the application of the Kitagawaâ€"Takahashi diagram to foreign-object damage and high-cycle fatigue. Engineering Fracture Mechanics, 2002, 69, 1425-1446.	2.0	86
17	Anomalous Fatigue Behavior and Fatigue-Induced Grain Growth in Nanocrystalline Nickel Alloys. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2011, 42, 1793-1804.	1.1	84
18	Strength Distributions in Polycrystalline Silicon MEMS. Journal of Microelectromechanical Systems, 2007, 16, 179-190.	1.7	83

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19	Modeling the anisotropic finite-deformation viscoelastic behavior of soft fiber-reinforced composites. International Journal of Solids and Structures, 2007, 44, 8366-8389.	1.3	81
20	Do voids nucleate at grain boundaries during ductile rupture?. Acta Materialia, 2017, 137, 103-114.	3.8	79
21	A Nonlinear Anisotropic Viscoelastic Model for the Tensile Behavior of the Corneal Stroma. Journal of Biomechanical Engineering, 2008, 130, 041020.	0.6	78
22	Frictional performance and near-surface evolution of nanocrystalline Niâ€"Fe as governed by contact stress and sliding velocity. Wear, 2013, 297, 860-871.	1.5	77
23	A physically based model of temperature and strain rate dependent yield in BCC metals: Implementation into crystal plasticity. Journal of the Mechanics and Physics of Solids, 2015, 74, 80-96.	2.3	76
24	An inverse finite element method for determining the anisotropic properties of the cornea. Biomechanics and Modeling in Mechanobiology, 2011, 10, 323-337.	1.4	75
25	Indentation fracture toughness and acoustic energy release in tetrahedral amorphous carbon diamond-like thin films. Acta Materialia, 2006, 54, 4043-4052.	3.8	74
26	The second Sandia Fracture Challenge: predictions of ductile failure under quasi-static and moderate-rate dynamic loading. International Journal of Fracture, 2016, 198, 5-100.	1.1	73
27	Grain boundary segregation in immiscible nanocrystalline alloys. Acta Materialia, 2017, 126, 528-539.	3.8	73
28	Multi-morphology lattices lead to improved plastic energy absorption. Materials and Design, 2020, 194, 108883.	3.3	70
29	The inflation response of the posterior bovine sclera. Acta Biomaterialia, 2010, 6, 4327-4335.	4.1	67
30	Characteristics of a commercially available silicon-on-insulator MEMS material. Sensors and Actuators A: Physical, 2007, 138, 130-144.	2.0	66
31	Extremeâ€Value Statistics Reveal Rare Failureâ€Critical Defects in Additive Manufacturing. Advanced Engineering Materials, 2017, 19, 1700102.	1.6	65
32	An atom probe study on Nb solute partitioning and nanocrystalline grain stabilization in mechanically alloyed Cu-Nb. Acta Materialia, 2017, 126, 564-575.	3.8	64
33	The third Sandia fracture challenge: predictions of ductile fracture in additively manufactured metal. International Journal of Fracture, 2019, 218, 5-61.	1.1	62
34	Very high-cycle fatigue failure in micron-scale polycrystalline silicon films: Effects of environment and surface oxide thickness. Journal of Applied Physics, 2007, 101, 013515.	1.1	60
35	Mechanisms of fatigue in LIGA Ni MEMS thin films. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2007, 444, 39-50.	2.6	60
36	The constitutive behavior of laser welds in 304L stainless steel determined by digital image correlation. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2006, 37, 2481-2492.	1.1	58

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37	An international round-robin experiment to evaluate the consistency of nanoindentation hardness measurements of thin films. Surface and Coatings Technology, 2003, 168, 57-61.	2.2	57
38	Fatigue of metallic microdevices and the role of fatigue-induced surface oxides. Acta Materialia, 2004, 52, 1609-1619.	3.8	57
39	Achieving Ultralow Wear with Stable Nanocrystalline Metals. Advanced Materials, 2018, 30, e1802026.	11.1	56
40	Mechanical relaxation of localized residual stresses associated with foreign object damage. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2003, 349, 48-58.	2.6	55
41	Stress-dependent grain size evolution of nanocrystalline Ni-W and its impact on friction behavior. Scripta Materialia, 2016, 123, 26-29.	2.6	55
42	Pragmatic generative optimization of novel structural lattice metamaterials with machine learning. Materials and Design, 2021, 203, 109632.	3.3	53
43	Interpreting the ductility of nanocrystalline metals¹. Journal of Materials Research, 2013, 28, 1539-1552.	1.2	46
44	High Cycle Fatigue in the Transmission Electron Microscope. Nano Letters, 2016, 16, 4946-4953.	4.5	46
45	Quantitative comparison between experimental measurements and CP-FEM predictions of plastic deformation in a tantalum oligocrystal. International Journal of Mechanical Sciences, 2015, 92, 98-108.	3.6	44
46	The effect of microstructural representation on simulations of microplastic ratcheting. International Journal of Plasticity, 2010, 26, 617-633.	4.1	42
47	Thermal Stability Comparison of Nanocrystalline Fe-Based Binary Alloy Pairs. Jom, 2016, 68, 1625-1633.	0.9	41
48	Room Temperature Deformation Mechanisms of Alumina Particles Observed from In Situ Micro-compression and Atomistic Simulations. Journal of Thermal Spray Technology, 2016, 25, 82-93.	1.6	39
49	The effect of nanoparticles on rough surface adhesion. Journal of Applied Physics, 2006, 99, 104304.	1.1	36
50	An experimental statistical analysis of stress projection factors in BCC tantalum. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2013, 581, 108-118.	2.6	35
51	Heterogeneities dominate mechanical performance of additively manufactured metal lattice struts. Additive Manufacturing, 2019, 28, 692-703.	1.7	35
52	The role of grain boundary character in solute segregation and thermal stability of nanocrystalline Ptâ€"Au. Nanoscale, 2021, 13, 3552-3563.	2.8	35
53	Predicting Fracture in Micrometer-Scale Polycrystalline Silicon MEMS Structures. Journal of Microelectromechanical Systems, 2011, 20, 922-932.	1.7	34
54	The onset and evolution of fatigue-induced abnormal grain growth in nanocrystalline Niâ€"Fe. Journal of Materials Science, 2017, 52, 46-59.	1.7	34

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55	Size-dependent stochastic tensile properties in additively manufactured 316L stainless steel. Additive Manufacturing, 2020, 32, 101090.	1.7	33
56	Collaborative ductile rupture mechanisms of high-purity copper identified by in situ X-ray computed tomography. Acta Materialia, 2019, 181, 377-384.	3.8	32
57	Progress toward autonomous experimental systems for alloy development. MRS Bulletin, 2019, 44, 273-280.	1.7	32
58	Automated high-throughput tensile testing reveals stochastic process parameter sensitivity. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2020, 772, 138632.	2.6	32
59	A Sequential Tensile Method for Rapid Characterization of Extreme-value Behavior in Microfabricated Materials. Experimental Mechanics, 2010, 50, 993-997.	1.1	31
60	The role of the interface stiffness tensor on grain boundary dynamics. Acta Materialia, 2018, 158, 440-453.	3.8	31
61	Coulombic friction in metamaterials to dissipate mechanical energy. Extreme Mechanics Letters, 2020, 40, 100847.	2.0	31
62	The Morphology of Tensile Failure in Tantalum. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2013, 44, 4567-4580.	1.1	30
63	Cryogenic indentation-induced grain growth in nanotwinned copper. Scripta Materialia, 2013, 68, 781-784.	2.6	30
64	Room temperature stress relaxation in nanocrystalline Ni measured by micropillar compression and miniature tension. Journal of Materials Research, 2016, 31, 1085-1095.	1.2	29
65	Nanoscale conditions for ductile void nucleation in copper: Vacancy condensation and the growth-limited microstructural state. Acta Materialia, 2020, 184, 211-224.	3.8	29
66	Spinodal Decomposition in Nanocrystalline Alloys. Acta Materialia, 2021, 215, 117054.	3.8	29
67	Effect of post-release sidewall morphology on the fracture and fatigue properties of polycrystalline silicon structural films. Sensors and Actuators A: Physical, 2008, 147, 553-560.	2.0	28
68	The effect of grain size on local deformation near a void-like stress concentration. International Journal of Plasticity, 2012, 39, 46-60.	4.1	28
69	New nanoscale toughening mechanisms mitigate embrittlement in binary nanocrystalline alloys. Nanoscale, 2018, 10, 21231-21243.	2.8	27
70	Interpenetrating lattices with enhanced mechanical functionality. Additive Manufacturing, 2021, 38, 101741.	1.7	27
71	Science-based MEMS reliability methodology. Microelectronics Reliability, 2007, 47, 1806-1811.	0.9	25
72	Increasing fracture toughness via architected porosity. Materials and Design, 2021, 205, 109696.	3.3	25

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73	The role of copper twin boundaries in cryogenic indentation-induced grain growth. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2014, 592, 182-188.	2.6	24
74	Dependence on diameter and growth direction of apparent strain to failure of Si nanowires. Journal of Applied Physics, 2011, 109, .	1.1	23
75	The hardness and strength of metal tribofilms: An apparent contradiction between nanoindentation and pillar compression. Acta Materialia, 2012, 60, 1712-1720.	3.8	23
76	Examining the influence of grain size on radiation tolerance in the nanocrystalline regime. Applied Physics Letters, 2018, 112, .	1.5	23
77	Compressive Properties of âŸ¨110âŸ© Cu Micro-Pillars after High-Dose Self-Ion Irradiation. Materials Research Letters, 2014, 2, 57-62.	4.1	22
78	Thermal Stability: The Next Frontier for Nanocrystalline Materials. Jom, 2015, 67, 2785-2787.	0.9	22
79	Predicting strength distributions of MEMS structures using flaw size and spatial density. Microsystems and Nanoengineering, 2019, 5, 49.	3.4	22
80	Fatigue and fracture of nanostructured metals and alloys. MRS Bulletin, 2021, 46, 258-264.	1.7	21
81	Stronger silicon for microsystems. Acta Materialia, 2010, 58, 439-448.	3.8	20
82	Evaluating Deformation-Induced Grain Orientation Change in a Polycrystal During <i>In Situ</i> Tensile Deformation using EBSD. Microscopy and Microanalysis, 2015, 21, 969-984.	0.2	20
83	Observations of fcc and hcp tantalum. Journal of Materials Science, 2015, 50, 3706-3715.	1.7	20
84	Fatigue stress concentration and notch sensitivity in nanocrystalline metals. Journal of Materials Research, 2016, 31, 740-752.	1.2	20
85	Amorphous intergranular films mitigate radiation damage in nanocrystalline Cu-Zr. Acta Materialia, 2020, 186, 341-354.	3.8	20
86	The mechanical properties, dimensional tolerance and microstructural characterization of micro-molded ceramic and metal components. Microsystem Technologies, 2004, 10, 506-509.	1.2	19
87	Irradiation-induced grain boundary facet motion: In situ observations and atomic-scale mechanisms. Science Advances, 2022, 8, .	4.7	18
88	Connections between morphological and mechanical evolution during galvanic corrosion of micromachined polycrystalline and monocrystalline silicon. Journal of Applied Physics, 2008, 103, .	1.1	17
89	Grain Boundary Responses to Heterogeneous Deformation in Tantalum Polycrystals. Jom, 2014, 66, 121-128.	0.9	17
90	Evidence that abnormal grain growth precedes fatigue crack initiation in nanocrystalline Ni-Fe. Scripta Materialia, 2018, 143, 15-19.	2.6	17

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91	Deep Convolutional Neural Networks as a Rapid Screening Tool for Complex Additively Manufactured Structures. Additive Manufacturing, 2020, 35, 101217.	1.7	17
92	An argument for proof testing brittle microsystems in high-reliability applications. Journal of Micromechanics and Microengineering, 2008, 18, 117001.	1.5	16
93	Development of a heterogeneous nanostructure through abnormal recrystallization of a nanotwinned Ni superalloy. Acta Materialia, 2020, 195, 132-140.	3.8	16
94	The grain boundary stiffness and its impact on equilibrium shapes and boundary migration: Analysis of the<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" altimg="si43.svg"><mml:mstyle mathvariant="normal"><mml:mi>Î£</mml:mi></mml:mstyle></mml:math>5, 7, 9, and 11 boundaries in Ni. Acta Materialia, 2021, 218, 117220.	3.8	16
95	Crystal plasticity simulations of microstructure-induced uncertainty in strain concentration near voids in brass. Philosophical Magazine, 2015, 95, 1069-1079.	0.7	15
96	Detecting rare, abnormally large grains by x-ray diffraction. Journal of Materials Science, 2015, 50, 6719-6729.	1.7	14
97	Revealing inconsistencies in X-ray width methods for nanomaterials. Nanoscale, 2019, 11, 22456-22466.	2.8	14
98	Exploring Coupled Extreme Environments via <i>In-situ</i> Transmission Electron Microscopy. Microscopy Today, 2021, 29, 28-34.	0.2	14
99	Galvanic corrosion induced degredation of tensile properties in micromachined polycrystalline silicon. Applied Physics Letters, 2007, 90, 191902.	1.5	13
100	Nanoprobing Fracture Length Scales. International Journal of Fracture, 2006, 138, 75-100.	1.1	12
101	<i>In situ</i> TEM measurement of activation volume in ultrafine grained gold. Nanoscale, 2020, 12, 7146-7158.	2.8	11
102	Topological homogenization of metamaterial variability. Materials Today, 2022, 53, 16-26.	8.3	11
103	Fatigue of LIGA Ni Micro-Electro-Mechanical System Thin Films. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2007, 38, 2340-2348.	1.1	10
104	Role of Microstructure and Doping on the Mechanical Strength and Toughness of Polysilicon Thin Films. Journal of Microelectromechanical Systems, 2015, 24, 1436-1452.	1.7	10
105	Corroborating tomographic defect metrics with mechanical response in an additively manufactured precipitation-hardened stainless steel. AIP Conference Proceedings, 2018, , .	0.3	10
106	In Situ High-Cycle Fatigue Reveals Importance of Grain Boundary Structure in Nanocrystalline Cu-Zr. Jom, 2019, 71, 1221-1232.	0.9	10
107	On the Strain Rate- and Temperature-Dependent Tensile Behavior of Eutectic Snâ€"Pb Solder. Journal of Electronic Packaging, Transactions of the ASME, 2011, 133, .	1.2	9
108	Rethinking scaling laws in the high-cycle fatigue response of nanostructured and coarse-grained metals. International Journal of Fatigue, 2020, 134, 105472.	2.8	9

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109	Stress-induced transition from vacancy annihilation to void nucleation near microcracks. International Journal of Solids and Structures, 2021, 213, 103-110.	1.3	8
110	High-throughput bend-strengths of ultra-small polysilicon MEMS components. Applied Physics Letters, 2021, 118, 201601.	1.5	8
111	Fatigue-driven acceleration of abnormal grain growth in nanocrystalline wires. Modelling and Simulation in Materials Science and Engineering, 2019, 27, 025008.	0.8	6
112	Micromechanics of Void Nucleation and Early Growth at Incoherent Precipitates: Lattice-Trapped and Dislocation-Mediated Delamination Modes. Crystals, 2021, 11, 45.	1.0	6
113	Shoulder fillet effects in strength distributions of microelectromechanical system components. Journal of Micromechanics and Microengineering, 2020, 30, 125013.	1.5	6
114	High-Throughput Statistical Interrogation of Mechanical Properties with Build Plate Location and Powder Reuse in AlSi10Mg. Jom, 2021, 73, 3356-3370.	0.9	6
115	Micromolding and sintering of nanoparticle preforms into microparts. , 2003, , .		5
116	Deformation and failure of small-scale structures. Jom, 2010, 62, 62-63.	0.9	5
117	Oxide driven strength evolution of silicon surfaces. Journal of Applied Physics, 2015, 118, .	1.1	5
118	A combined thermomechanical and radiation testing platform for a 6 MV tandem accelerator. Nuclear Instruments & Methods in Physics Research B, 2021, 509, 39-47.	0.6	5
119	The Role of Microstructure in MEMS Deformation and Failure. , 2002, , 559.		4
120	An Experimental Study of Fracture of LIGA Ni Micro-Electro-Mechanical Systems Thin Films. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2007, 38, 1223-1230.	1.1	4
121	Suppression of Void Nucleation in High-Purity Aluminum via Dynamic Recrystallization. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2020, 51, 154-166.	1.1	4
122	Solute segregation improves the high-cycle fatigue resistance of nanocrystalline Pt-Au. Acta Materialia, 2022, 229, 117794.	3.8	4
123	The Fabrication of Stainless Steel Parts for MEMs. Materials Research Society Symposia Proceedings, 2001, 687, 1.	0.1	3
124	Preface to the Special Issue on the Sandia Fracture Challenge. International Journal of Fracture, 2014, 186, 1-3.	1.1	3
125	Emerging Methods in Mechanical Behavior. Experimental Mechanics, 2010, 50, 3-3.	1.1	2
126	Actuation for deformable thin-shelled composite mirrors. Proceedings of SPIE, 2011, , .	0.8	2

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127	Finite element modeling and testing of a deformable carbon fiber reinforced polymer mirror. Applied Optics, 2012, 51, 2081.	0.9	2
128	Preface to the special volume on the second Sandia Fracture Challenge. International Journal of Fracture, 2016, 198, 1-3.	1.1	2
129	An experimental approach for enhancing the predictability of mechanical properties of additively manufactured architected materials with manufacturing-induced variability. , 2020, , 539-565.		2
130	Watching High-Cycle Fatigue with Automated Scanning Electron Microscope Experiments. Conference Proceedings of the Society for Experimental Mechanics, 2021, , 73-76.	0.3	2
131	Identifying the microstructural features associated with void nucleation during elevatedâ€temperature deformation of copper. Fatigue and Fracture of Engineering Materials and Structures, 2022, 45, 1882-1899.	1.7	2
132	A Spatially-resolved Synchrotron Diffraction Method for Evaluating Impact-induced Residual Stresses. Journal of Neutron Research, 2004, 12, 75-80.	0.4	1
133	Modeling the Anisotropic Finite-Deformation Viscoelastic Behavior of Soft Fiber-Reinforced Tissues. , 2007, , .		1
134	Observations on Heavily Deformed Tantalum. Microscopy and Microanalysis, 2014, 20, 1082-1083.	0.2	1
135	Characterization of Void-Dominated Ductile Failure in Pure Ta. Microscopy and Microanalysis, 2015, 21, 1163-1164.	0.2	1
136	Combining Orientation Mapping and In Situ TEM to Investigate High-Cycle Fatigue and Failure. Microscopy and Microanalysis, 2016, 22, 1736-1737.	0.2	1
137	Fatigue of LIGA nickel. , 2003, , .		0
138	Experimental apparatus and software design for dynamic long-term reliability testing of a spring-mass MEMS device. , 2006, 6111, 184.		0
139	Papers from the 2009 TMS Annual Meeting Symposium on Mechanisms, theory, experiments and industrial practice in fatigue. International Journal of Fatigue, 2010, 32, 791-791.	2.8	0
140	Design and verification of a finite element model for a thin-shelled composite mirror for use with MEMS active optics. , 2012, , .		0
141	Development of the In-Situ Ion Irradiation SEM at Sandia National Laboratories. Microscopy and Microanalysis, 2019, 25, 1596-1597.	0.2	0
142	Analytical Methods to Understand Deformation Mechanics in Additively Manufactured Metals. Conference Proceedings of the Society for Experimental Mechanics, 2021, , 53-56.	0.3	0
143	Microstructure and Reliability of Surface Micromachined Polysilicon Used for MEMS. , 2003, , .		0
144	Constitutive Gradients and Pore Tolerance in Two Weldments. , 2006, , .		0

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145	Modeling the Finite Deformation Anisotropic Viscoelastic Behavior of the Cornea. , 2008, , .		0
146	V-Notched Rail Test for Shear-Dominated Deformation of Ti-6Al-4V. Conference Proceedings of the Society for Experimental Mechanics, 2016, , 51-60.	0.3	0
147	Optimization of Stochastic Feature Properties in Laser Powder Bed Fusion. Additive Manufacturing, 2022, , 102943.	1.7	0