

William D Nix

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114
papers

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h-index

118
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118
ext. papers

21,728
ext. citations

6.2
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7.07
L-index

#	Paper	IF	Citations
114	Indentation size effects in crystalline materials: A law for strain gradient plasticity. <i>Journal of the Mechanics and Physics of Solids</i> , 1998 , 46, 411-425	5	3027
113	Mechanical properties of thin films. <i>Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science</i> , 1989 , 20, 2217-2245		2024
112	Sample dimensions influence strength and crystal plasticity. <i>Science</i> , 2004 , 305, 986-9	33.3	1766
111	What is the Young's Modulus of Silicon?. <i>Journal of Microelectromechanical Systems</i> , 2010 , 19, 229-238	2.5	1299
110	Size dependence of mechanical properties of gold at the micron scale in the absence of strain gradients. <i>Acta Materialia</i> , 2005 , 53, 1821-1830	8.4	1175
109	Effects of the substrate on the determination of thin film mechanical properties by nanoindentation. <i>Acta Materialia</i> , 2002 , 50, 23-38	8.4	1171
108	Interconnected silicon hollow nanospheres for lithium-ion battery anodes with long cycle life. <i>Nano Letters</i> , 2011 , 11, 2949-54	11.5	1155
107	25th anniversary article: Understanding the lithiation of silicon and other alloying anodes for lithium-ion batteries. <i>Advanced Materials</i> , 2013 , 25, 4966-85	24	974
106	Nanoscale gold pillars strengthened through dislocation starvation. <i>Physical Review B</i> , 2006 , 73,	3.3	695
105	In situ TEM of two-phase lithiation of amorphous silicon nanospheres. <i>Nano Letters</i> , 2013 , 13, 758-64	11.5	573
104	Stresses and deformation processes in thin films on substrates. <i>Critical Reviews in Solid State and Materials Sciences</i> , 1988 , 14, 225-268	10.1	482
103	Studying the kinetics of crystalline silicon nanoparticle lithiation with in situ transmission electron microscopy. <i>Advanced Materials</i> , 2012 , 24, 6034-41	24	466
102	Fracture of crystalline silicon nanopillars during electrochemical lithium insertion. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012 , 109, 4080-5	11.5	326
101	Size-dependent fracture of Si nanowire battery anodes. <i>Journal of the Mechanics and Physics of Solids</i> , 2011 , 59, 1717-1730	5	303
100	Elastic and plastic properties of thin films on substrates: nanoindentation techniques. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 1997 , 234-236, 37-44	5.3	254
99	Novel size and surface oxide effects in silicon nanowires as lithium battery anodes. <i>Nano Letters</i> , 2011 , 11, 4018-25	11.5	251
98	Deformation at the nanometer and micrometer length scales: Effects of strain gradients and dislocation starvation. <i>Thin Solid Films</i> , 2007 , 515, 3152-3157	2.2	233

97	SURFACE ROUGHENING OF HETEROEPITAXIAL THIN FILMS. <i>Annual Review of Materials Research</i> , 1999 , 29, 173-209		216
96	Yielding and strain hardening of thin metal films on substrates. <i>Scripta Materialia</i> , 1998 , 39, 545-554	5.6	191
95	Mechanism-based strain gradient crystal plasticity Theory. <i>Journal of the Mechanics and Physics of Solids</i> , 2005 , 53, 1188-1203	5	163
94	Indentation size effect in MgO. <i>Scripta Materialia</i> , 2004 , 51, 599-603	5.6	158
93	The Role of Indentation Depth on the Measured Hardness of Materials. <i>Materials Research Society Symposia Proceedings</i> , 1993 , 308, 613		158
92	Indentation of a soft metal film on a hard substrate: strain gradient hardening effects. <i>Journal of the Mechanics and Physics of Solids</i> , 2001 , 49, 1997-2014	5	149
91	Uniaxial compression of fcc Au nanopillars on an MgO substrate: The effects of prestraining and annealing. <i>Acta Materialia</i> , 2009 , 57, 4404-4415	8.4	143
90	Instrumented nanoindentation and 3D mechanistic modeling of a shale at multiple scales. <i>Acta Geotechnica</i> , 2015 , 10, 1-14	4.9	140
89	Indentation plastic displacement field: Part I. The case of soft films on hard substrates. <i>Journal of Materials Research</i> , 1999 , 14, 2196-2203	2.5	135
88	Strain relaxation and defect formation in heteroepitaxial Si _{1-x} Ge _x films via surface roughening induced by controlled annealing experiments. <i>Applied Physics Letters</i> , 1997 , 70, 2247-2249	3.4	123
87	Indentation plastic displacement field: Part II. The case of hard films on soft substrates. <i>Journal of Materials Research</i> , 1999 , 14, 2204-2209	2.5	113
86	Size effect in compression of single-crystal gold microparticles. <i>Acta Materialia</i> , 2011 , 59, 5202-5215	8.4	111
85	Stress in metal lines under passivation; comparison of experiment with finite element calculations. <i>Applied Physics Letters</i> , 1991 , 58, 1845-1847	3.4	109
84	Mechanical properties of compositionally modulated Au-Ni thin films: Nanoindentation and microcantilever deflection experiments. <i>Journal of Materials Research</i> , 1994 , 9, 3131-3144	2.5	108
83	Kinetics and fracture resistance of lithiated silicon nanostructure pairs controlled by their mechanical interaction. <i>Nature Communications</i> , 2015 , 6, 7533	17.4	91
82	Size dependence of the yield strength of fcc and bcc metallic micropillars with diameters of a few micrometers. <i>Philosophical Magazine</i> , 2012 , 92, 1238-1260	1.6	91
81	Critical thickness enhancement of epitaxial SiGe films grown on small structures. <i>Journal of Applied Physics</i> , 2005 , 97, 043519	2.5	91
80	Mechanical behavior of electrochemically lithiated silicon. <i>Journal of Power Sources</i> , 2015 , 273, 41-51	8.9	88

79	Study of strain softening behavior of Al ₂ O ₃ /SiC multilayers using microcompression testing. <i>Acta Materialia</i> , 2009 , 57, 4473-4490	8.4	79
78	Microstructure of thermal hillocks on blanket Al thin films. <i>Thin Solid Films</i> , 2000 , 371, 278-282	2.2	72
77	Quantitative impedance measurement using atomic force microscopy. <i>Journal of Applied Physics</i> , 2004 , 96, 3540-3549	2.5	66
76	A model for electromigration-induced degradation mechanisms in dual-inlaid copper interconnects: Effect of microstructure. <i>Journal of Applied Physics</i> , 2007 , 102, 053505	2.5	59
75	Mechanism-based strain gradient crystal plasticity ^{II} . Analysis. <i>Journal of the Mechanics and Physics of Solids</i> , 2005 , 53, 1204-1222	5	59
74	Microscopic model for fracture of crystalline Si nanopillars during lithiation. <i>Journal of Power Sources</i> , 2014 , 255, 274-282	8.9	55
73	Experimental Examination of the Push-Down Technique for Measuring the Sliding Resistance of Silicon Carbide Fibers in a Ceramic Matrix. <i>Journal of the American Ceramic Society</i> , 1991 , 74, 524-534	3.8	53
72	Micro-pillar plasticity controlled by dislocation nucleation at surfaces. <i>Philosophical Magazine</i> , 2011 , 91, 1084-1096	1.6	50
71	Robustness of amorphous silicon during the initial lithiation/delithiation cycle. <i>Journal of Power Sources</i> , 2014 , 258, 253-259	8.9	49
70	Modelling dislocations in a free-standing thin film. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2009 , 17, 075007	2	48
69	Fracture of crystalline germanium during electrochemical lithium insertion. <i>Extreme Mechanics Letters</i> , 2015 , 2, 15-19	3.9	44
68	Plasticity of bcc micropillars controlled by competition between dislocation multiplication and depletion. <i>Acta Materialia</i> , 2013 , 61, 3233-3241	8.4	42
67	A model for hillock growth in Al thin films controlled by plastic deformation. <i>Acta Materialia</i> , 2007 , 55, 5297-5301	8.4	42
66	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	8.4	41
65	Microstructure Effect on EM-Induced Degradations in Dual Inlaid Copper Interconnects. <i>IEEE Transactions on Device and Materials Reliability</i> , 2009 , 9, 87-97	1.6	40
64	An analysis technique for extraction of thin film stresses from x-ray data. <i>Applied Physics Letters</i> , 1997 , 71, 2949-2951	3.4	39
63	The elastic biaxial modulus of Ag ₂ S multilayered thin films measured using the bulge test. <i>Journal of Materials Research</i> , 1994 , 9, 25-30	2.5	36
62	A quantitative analysis for the stress field around an elastoplastic indentation/contact. <i>Journal of Materials Research</i> , 2009 , 24, 704-718	2.5	30

61	Critical-temperature/Peierls-stress dependent size effects in body centered cubic nanopillars. <i>Applied Physics Letters</i> , 2013 , 102, 041910	3.4	29
60	Intrinsic stresses in compositionally modulated Au-Ni thin films and the supermodulus effect. <i>Journal of Materials Research</i> , 1994 , 9, 3145-3152	2.5	29
59	Stress-driven surface evolution in heteroepitaxial thin films: Anisotropy of the two-dimensional roughening mode. <i>Journal of Materials Research</i> , 1999 , 14, 3247-3256	2.5	26
58	Effects of focused-ion-beam irradiation and prestraining on the mechanical properties of FCC Au microparticles on a sapphire substrate. <i>Journal of Materials Research</i> , 2011 , 26, 1653-1661	2.5	25
57	Growth of Highly Strained CeO Ultrathin Films. <i>ACS Nano</i> , 2016 , 10, 9938-9947	16.7	23
56	Geometrical analysis of 3D dislocation dynamics simulations of FCC micro-pillar plasticity. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2010 , 527, 1903-1910	5.3	23
55	Creep-controlled diffusional hillock formation in blanket aluminum thin films as a mechanism of stress relaxation. <i>Journal of Materials Research</i> , 2000 , 15, 1709-1718	2.5	23
54	A physically based model for indenter tip shape calibration for nanoindentation. <i>Journal of Materials Research</i> , 2010 , 25, 735-745	2.5	21
53	Correlating the Mechanical Properties of a Continuous Fiber-Reinforced Ceramic-Matrix Composite to the Sliding Resistance of the Fibers. <i>Journal of the American Ceramic Society</i> , 1991 , 74, 535-540	3.8	20
52	Statistics of Jogs on Dislocations at Equilibrium. <i>Journal of Applied Physics</i> , 1965 , 36, 1727-1732	2.5	20
51	Reaction Front Evolution during Electrochemical Lithiation of Crystalline Silicon Nanopillars. <i>Israel Journal of Chemistry</i> , 2012 , 52, 1118-1123	3.4	18
50	Exploring specimen size effects in plastic deformation of Ni ₃ (Al, Ta). <i>Materials Research Society Symposia Proceedings</i> , 2002 , 753, 1		18
49	Extracting thin film hardness of extremely compliant films on stiff substrates. <i>Thin Solid Films</i> , 2011 , 519, 3221-3224	2.2	16
48	Accuracy and Reliability of Bulge Test Experiments. <i>Materials Research Society Symposia Proceedings</i> , 1993 , 308, 159		16
47	Mechanical Properties Of Compositionally Modulated Au-Ni Thin Films Using Indentation And Microbeam Deflection Techniques. <i>Materials Research Society Symposia Proceedings</i> , 1990 , 188, 289		16
46	Observations of Dislocation Sources in an Aluminium-Copper-Silicon Alloy. <i>Philosophical Magazine and Journal</i> , 1968 , 18, 217-228		15
45	Dislocation junctions and jogs in a free-standing FCC thin film. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2011 , 19, 025002	2	14
44	Coercive Force of Iron Resulting from the Interaction of Domain Boundaries with Large Nonmagnetic Inclusions. <i>Physical Review</i> , 1964 , 135, A401-A407		14

43	Anisotropic Size-Dependent Plasticity in Face-Centered Cubic Micropillars Under Torsion. <i>Jom</i> , 2016 , 68, 253-260	2.1	13
42	Time-Dependent Deformation in Room-Temperature Indentation Experiments using a Nanoindenter. <i>Materials Research Society Symposia Proceedings</i> , 1991 , 239, 319		12
41	Interfacial Structure and Mechanical Properties of Compositionally-Modulated Au/Ni thin Films. <i>Materials Research Society Symposia Proceedings</i> , 1994 , 343, 555		11
40	Single-crystal metal growth on amorphous insulating substrates. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2018 , 115, 685-689	11.5	10
39	In-Situ Observation of Electromigration in Eutectic SnPb Solder Lines: Atomic Migration and Hillock Formation. <i>Journal of Electronic Materials</i> , 2007 , 36, 562-567	1.9	10
38	Blister Test Analysis Methods. <i>Materials Research Society Symposia Proceedings</i> , 1994 , 356, 585		10
37	Strain Relaxation in Heteroepitaxial Si _{1-x} Ge _x Films via Surface Roughening Processes. <i>Materials Research Society Symposia Proceedings</i> , 1995 , 399, 407		10
36	Anisotropic mechanical properties of zircon and the effect of radiation damage. <i>Physics and Chemistry of Minerals</i> , 2016 , 43, 627-638	1.6	10
35	Mechanical properties of natural radiation-damaged titanite and temperature-induced structural reorganization: A nanoindentation and Raman spectroscopic study. <i>American Mineralogist</i> , 2016 , 101, 399-406	2.9	9
34	Anisotropic Behaviour of Surface Roughening in Lattice Mismatched Heteroepitaxial Thin Films. <i>Materials Research Society Symposia Proceedings</i> , 1996 , 436, 487		7
33	Re-Examining the Bulge Test: Methods for Improving Accuracy and Reliability. <i>Materials Research Society Symposia Proceedings</i> , 1991 , 239, 257		7
32	Mechanical Behavior of Thin Films. <i>MRS Bulletin</i> , 1992 , 17, 25-27	3.2	7
31	High Temperature Deformation of Single Crystals of NiAl. <i>Materials Research Society Symposia Proceedings</i> , 1992 , 288, 45		7
30	Dislocation velocities in LiF based on the annealing kinetics of dislocations dipoles. <i>Materials Science and Engineering</i> , 1970 , 5, 179-192		7
29	Radiation-damage-induced transitions in zircon: Percolation theory applied to hardness and elastic moduli as a function of density. <i>Applied Physics Letters</i> , 2018 , 112, 201901	3.4	7
28	High-Throughput Growth of Microscale Gold Bicrystals for Single-Grain-Boundary Studies. <i>Advanced Materials</i> , 2019 , 31, e1902189	24	6
27	Exploiting New Opportunities in Materials Research by Remembering and Applying Old Lessons. <i>MRS Bulletin</i> , 2009 , 34, 82-91	3.2	6
26	A model for power law creep controlled hillock growth. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2008 , 488, 594-600	5.3	6

25	Study of the Yielding and Strain Hardening Behavior of a Copper Thin Film on a Silicon Substrate Using Microbeam Bending. <i>Materials Research Society Symposia Proceedings</i> , 2001 , 673, 1	6
24	Mechanical Properties of Ag/Cr Multilayered Epitaxial thin Films. <i>Materials Research Society Symposia Proceedings</i> , 1994 , 356, 363	6
23	An Experimental and Computational Study of the Elastic-Plastic Transition in Thin Films. <i>Materials Research Society Symposia Proceedings</i> , 2001 , 673, 1	5
22	Stress Evolution During Growth of Sputtered Ni/Cu Multilayers. <i>Materials Research Society Symposia Proceedings</i> , 1998 , 528, 161	5
21	Stress Evolution in Sputtered FCC Metal Multilayers. <i>Materials Research Society Symposia Proceedings</i> , 1997 , 505, 589	4
20	In Situ Study of Isothermal Strain Relaxation in Si-Ge Heteroepitaxial Films Using Substrate Curvature Measurements. <i>Materials Research Society Symposia Proceedings</i> , 1991 , 239, 395	4
19	Domain Configurations About Nonmagnetic Particles in Iron. <i>Physical Review</i> , 1961 , 121, 1038-1042	4
18	Radiation-damage in multi-layered zircon: Mechanical properties. <i>Applied Physics Letters</i> , 2019 , 115, 081902	3
17	Studies of Morphological Instability and Dislocation Formation in Heteroepitaxial Si _{1-x} Ge _x Thin Films Via Controlled Annealing Experiments. <i>Materials Research Society Symposia Proceedings</i> , 1996 , 440, 323	3
16	Intrinsic size dependent plasticity in BCC micro-pillars under uniaxial tension and pure torsion. <i>Extreme Mechanics Letters</i> , 2020 , 40, 100901	3.9 3
15	Effect of Stresses on Defect Nucleation in Si _{1-x} Ge _x /Si Heteroepitaxial Systems. <i>Materials Research Society Symposia Proceedings</i> , 1996 , 442, 373	2
14	Role of Dislocation Interactions in Decreasing Mobile Threading Dislocation Density and Limiting Strain Relaxation in Si _{1-x} Ge _x Heteroepitaxial Films. <i>Materials Research Society Symposia Proceedings</i> , 1994 , 356, 283	2
13	Calculation of the [111]-Texture Dependence of the Elastic Biaxial Modulus. <i>Materials Research Society Symposia Proceedings</i> , 1994 , 343, 561	2
12	Transient Deformation of Single Crystal NiAl at High Temperatures. <i>Materials Research Society Symposia Proceedings</i> , 1992 , 288, 749	2
11	Self stresses and line tensions in dislocation loops. <i>Materials Science and Engineering</i> , 1968 , 3, 175-182	2
10	Radiation-induced effects on the mechanical properties of natural ZrSiO ₄ : double cascade-overlap damage accumulation. <i>Physics and Chemistry of Minerals</i> , 2018 , 45, 435-442	1.6 2
9	In-Situ TEM Observations of Surface Roughening and Defect Formation in Lattice Mismatched Heteroepitaxial Thin Films. <i>Materials Research Society Symposia Proceedings</i> , 1997 , 505, 291	1
8	Mechanism-based strain gradient crystal plasticity. <i>Materials Research Society Symposia Proceedings</i> , 2004 , 821, 198	1

- 7 Stress Dependence of the Velocity of Threading Dislocation Segments in Si - Ge Heteroepitaxial Films.. *Materials Research Society Symposia Proceedings*, **1993**, 308, 411 1
- 6 Structure and Mechanical Properties of Fe/Zr Multilayers. *Materials Research Society Symposia Proceedings*, **1991**, 239, 493 1
- 5 Technique for the Determination of the Magnetic History of Local Regions in Cubic Ferromagnets. *Journal of Applied Physics*, **1964**, 35, 3057-3058 2.5 1
- 4 Scanning Stiffness Microscopy - A Novel Technique for Detecting Sub-Surface Cracks. *Materials Research Society Symposia Proceedings*, **1997**, 473, 285
- 3 Comparison of Line Stress Predictions with Measured Electromigration Failure Times. *Materials Research Society Symposia Proceedings*, **2005**, 863, B7.7-1
- 2 Diffusional Hillcock Formation in Al Thin Films Controlled by Creep. *Materials Research Society Symposia Proceedings*, **1999**, 594, 129
- 1 A Review of: Theory of Dislocations, Third Edition, Peter M. Anderson, John P. Hirth and Jens Lothe, Cambridge University Press, 2017. *Journal of Applied Mechanics, Transactions ASME*,1-2 2.7