

Joost J Vlassak

List of Publications by Year in descending order

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Version: 2024-02-01

118
papers

13,650
citations

44069

48
h-index

20961

115
g-index

120
all docs

120
docs citations

120
times ranked

15038
citing authors

#	ARTICLE	IF	CITATIONS
1	Highly stretchable and tough hydrogels. <i>Nature</i> , 2012, 489, 133-136.	27.8	4,089
2	Instrumented cardiac microphysiological devices via multimaterial three-dimensional printing. <i>Nature Materials</i> , 2017, 16, 303-308.	27.5	652
3	Highly Stretchable and Tough Hydrogels below Water Freezing Temperature. <i>Advanced Materials</i> , 2018, 30, e1801541.	21.0	444
4	Extremely Stretchable and Fast Self-Healing Hydrogels. <i>Advanced Materials</i> , 2016, 28, 4678-4683.	21.0	394
5	3D Printing of Transparent and Conductive Heterogeneous Hydrogel-Elastomer Systems. <i>Advanced Materials</i> , 2017, 29, 1604827.	21.0	364
6	Hybrid Hydrogels with Extremely High Stiffness and Toughness. <i>ACS Macro Letters</i> , 2014, 3, 520-523.	4.8	354
7	Fracture of electrodes in lithium-ion batteries caused by fast charging. <i>Journal of Applied Physics</i> , 2010, 108, .	2.5	348
8	Numerical study on the measurement of thin film mechanical properties by means of nanoindentation. <i>Journal of Materials Research</i> , 2001, 16, 2974-2982.	2.6	312
9	Stiff, strong, and tough hydrogels with good chemical stability. <i>Journal of Materials Chemistry B</i> , 2014, 2, 6708-6713.	5.8	302
10	Lithium-Assisted Plastic Deformation of Silicon Electrodes in Lithium-Ion Batteries: A First-Principles Theoretical Study. <i>Nano Letters</i> , 2011, 11, 2962-2967.	9.1	301
11	Ultra-sensitive and resilient compliant strain gauges for soft machines. <i>Nature</i> , 2020, 587, 219-224.	27.8	279
12	Large Plastic Deformation in High-Capacity Lithium-Ion Batteries Caused by Charge and Discharge. <i>Journal of the American Ceramic Society</i> , 2011, 94, s226.	3.8	276
13	High ductility of a metal film adherent on a polymer substrate. <i>Applied Physics Letters</i> , 2005, 87, 161910.	3.3	262
14	Indentation modulus of elastically anisotropic half spaces. <i>Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties</i> , 1993, 67, 1045-1056.	0.6	259
15	Concurrent Reaction and Plasticity during Initial Lithiation of Crystalline Silicon in Lithium-Ion Batteries. <i>Journal of the Electrochemical Society</i> , 2012, 159, A238-A243.	2.9	256
16	Using indentation to characterize the poroelasticity of gels. <i>Applied Physics Letters</i> , 2010, 96, .	3.3	236
17	The effect of film thickness on the failure strain of polymer-supported metal films. <i>Acta Materialia</i> , 2010, 58, 1679-1687.	7.9	221
18	Kinetics of Initial Lithiation of Crystalline Silicon Electrodes of Lithium-Ion Batteries. <i>Nano Letters</i> , 2012, 12, 5039-5047.	9.1	206

#	ARTICLE	IF	CITATIONS
19	Reactive Flow in Silicon Electrodes Assisted by the Insertion of Lithium. <i>Nano Letters</i> , 2012, 12, 4397-4403.	9.1	160
20	Mechanically Versatile Soft Machines through Laminar Jamming. <i>Advanced Functional Materials</i> , 2018, 28, 1707136.	14.9	159
21	Determining the elastic modulus and hardness of an ultra-thin film on a substrate using nanoindentation. <i>Journal of Materials Research</i> , 2009, 24, 1114-1126.	2.6	157
22	Inelastic hosts as electrodes for high-capacity lithium-ion batteries. <i>Journal of Applied Physics</i> , 2011, 109, .	2.5	151
23	Measurements of the Fracture Energy of Lithiated Silicon Electrodes of Li-Ion Batteries. <i>Nano Letters</i> , 2013, 13, 5570-5577.	9.1	151
24	Fatigue fracture of hydrogels. <i>Extreme Mechanics Letters</i> , 2017, 10, 24-31.	4.1	151
25	Novel technique for measuring the mechanical properties of porous materials by nanoindentation. <i>Journal of Materials Research</i> , 2006, 21, 715-724.	2.6	109
26	Spectral descriptors for bulk metallic glasses based on the thermodynamics of competing crystalline phases. <i>Nature Communications</i> , 2016, 7, 12315.	12.8	104
27	Experimental determination of equations of state for ideal elastomeric gels. <i>Soft Matter</i> , 2012, 8, 8121.	2.7	97
28	Variation of stress with charging rate due to strain-rate sensitivity of silicon electrodes of Li-ion batteries. <i>Journal of Power Sources</i> , 2014, 270, 569-575.	7.8	96
29	Adhesion between highly stretchable materials. <i>Soft Matter</i> , 2016, 12, 1093-1099.	2.7	93
30	Indentation of polydimethylsiloxane submerged in organic solvents. <i>Journal of Materials Research</i> , 2011, 26, 785-795.	2.6	87
31	A simple technique for measuring the adhesion of brittle films to ductile substrates with application to diamond-coated titanium. <i>Journal of Materials Research</i> , 1997, 12, 1900-1910.	2.6	81
32	Design Molecular Topology for Wetâ€“Dry Adhesion. <i>ACS Applied Materials & Interfaces</i> , 2019, 11, 24802-24811.	8.0	76
33	Fatigue of polymer-supported Ag thin films. <i>Scripta Materialia</i> , 2012, 66, 915-918.	5.2	73
34	A model of ideal elastomeric gels for polyelectrolyte gels. <i>Soft Matter</i> , 2014, 10, 2582.	2.7	72
35	Fire-Resistant Hydrogel-Fabric Laminates: A Simple Concept That May Save Lives. <i>ACS Applied Materials & Interfaces</i> , 2016, 8, 2071-2077.	8.0	69
36	Crystallization kinetics of amorphous NiTi shape memory alloy thin films. <i>Scripta Materialia</i> , 2006, 54, 925-930.	5.2	68

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37	Crystallization behavior upon heating and cooling in Cu ₅₀ Zr ₅₀ metallic glass thin films. <i>Acta Materialia</i> , 2016, 121, 68-77.	7.9	64
38	Stiffening of organosilicate glasses by organic cross-linking. <i>Acta Materialia</i> , 2011, 59, 44-52.	7.9	63
39	Combinatorial nanocalorimetry. <i>Journal of Materials Research</i> , 2010, 25, 2086-2100.	2.6	62
40	Poroelastic relaxation indentation of thin layers of gels. <i>Journal of Applied Physics</i> , 2011, 110, 086103.	2.5	61
41	Dislocation climb in two-dimensional discrete dislocation dynamics. <i>Journal of Applied Physics</i> , 2012, 111, .	2.5	59
42	Effects of stretching and cycling on the fatigue behavior of polymer-supported Ag thin films. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2013, 575, 86-93.	5.6	57
43	Measurements of stress and fracture in germanium electrodes of lithium-ion batteries during electrochemical lithiation and delithiation. <i>Journal of Power Sources</i> , 2016, 304, 164-169.	7.8	57
44	Force and stroke of a hydrogel actuator. <i>Soft Matter</i> , 2013, 9, 8504.	2.7	56
45	Inorganic islands on a highly stretchable polyimide substrate. <i>Journal of Materials Research</i> , 2009, 24, 3338-3342.	2.6	54
46	Constraint Effects on Thin Film Channel Cracking Behavior. <i>Journal of Materials Research</i> , 2005, 20, 2266-2273.	2.6	52
47	Indentation: A simple, nondestructive method for characterizing the mechanical and transport properties of pH-sensitive hydrogels. <i>Journal of Materials Research</i> , 2012, 27, 152-160.	2.6	52
48	Combining combinatorial nanocalorimetry and X-ray diffraction techniques to study the effects of composition and quench rate on Au-Cu-Si metallic glasses. <i>Scripta Materialia</i> , 2012, 66, 178-181.	5.2	49
49	Determination of critical cooling rates in metallic glass forming alloy libraries through laser spike annealing. <i>Scientific Reports</i> , 2017, 7, 7155.	3.3	49
50	Dislocation evolution during plastic deformation: Equations vs. discrete dislocation dynamics study. <i>Journal of Applied Physics</i> , 2018, 123, .	2.5	49
51	Micromechanics of macroelectronics. <i>Particuology: Science and Technology of Particles</i> , 2005, 3, 321-328.	0.4	48
52	Improving the stretchability of as-deposited Ag coatings on poly-ethylene-terephthalate substrates through use of an acrylic primer. <i>Journal of Applied Physics</i> , 2011, 109, .	2.5	44
53	Nanocalorimetry: Door opened for in situ material characterization under extreme non-equilibrium conditions. <i>Progress in Materials Science</i> , 2019, 104, 53-137.	32.8	44
54	Transforming the Dynamic Response of Robotic Structures and Systems Through Laminar Jamming. <i>IEEE Robotics and Automation Letters</i> , 2018, 3, 688-695.	5.1	42

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55	The effect of porogen loading on the stiffness and fracture energy of brittle organosilicates. Journal of Materials Research, 2009, 24, 107-116.	2.6	41
56	Low-Temperature Synthesis of Ultra-High-Temperature Coatings of ZrB ₂ Using Reactive Multilayers. Journal of Physical Chemistry C, 2014, 118, 21192-21198.	3.1	41
57	A scanning AC calorimetry technique for the analysis of nano-scale quantities of materials. Review of Scientific Instruments, 2012, 83, 114901.	1.3	39
58	Microstructural evolution induced by micro-cracking during fast lithiation of single-crystalline silicon. Journal of Power Sources, 2014, 265, 160-165.	7.8	38
59	Adhesion between Hydrophobic Elastomer and Hydrogel through Hydrophilic Modification and Interfacial Segregation. ACS Applied Materials & Interfaces, 2018, 10, 43252-43261.	8.0	38
60	The Mechanical Properties of Electroplated Cu Thin Films Measured by means of the Bulge Test Technique. Materials Research Society Symposia Proceedings, 2001, 695, 1.	0.1	36
61	Scanning AC nanocalorimetry combined with <i>in-situ</i> x-ray diffraction. Journal of Applied Physics, 2013, 113, .	2.5	36
62	Analysis of Ti-Ni-Hf shape memory alloys by combinatorial nanocalorimetry. Acta Materialia, 2011, 59, 7602-7614.	7.9	34
63	Electromigration-induced extrusion failures in Cu/low-k interconnects. Journal of Applied Physics, 2008, 104, .	2.5	33
64	Nano-thermal transport array: An instrument for combinatorial measurements of heat transfer in nanoscale films. Thin Solid Films, 2010, 518, 7093-7106.	1.8	33
65	<i>In-situ</i> X-ray diffraction combined with scanning AC nanocalorimetry applied to a Fe _{0.84} Ni _{0.16} thin-film sample. Applied Physics Letters, 2013, 102, 201902.	3.3	33
66	An apparatus for performing microtensile tests at elevated temperatures inside a scanning electron microscope. Acta Materialia, 2013, 61, 7500-7510.	7.9	32
67	High-temperature tensile behavior of freestanding Au thin films. Scripta Materialia, 2014, 75, 34-37.	5.2	32
68	A simple technique for measuring the fracture energy of lithiated thin-film silicon electrodes at various lithium concentrations. Journal of Power Sources, 2015, 294, 159-166.	7.8	32
69	Lightweight Highly Tunable Jamming-Based Composites. Soft Robotics, 2020, 7, 724-735.	8.0	32
70	Water diffusion and fracture behavior in nanoporous low-k dielectric film stacks. Journal of Applied Physics, 2009, 106, 033503.	2.5	30
71	Precipitation and thermal fatigue in Ni-Ti-Zr shape memory alloy thin films by combinatorial nanocalorimetry. Acta Materialia, 2011, 59, 5116-5124.	7.9	30
72	Solidification of Au-Cu-Si alloys investigated by a combinatorial approach. Journal of Applied Physics, 2012, 111, .	2.5	30

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73	Hydrogel bowls for cleaning oil spills on water. <i>Water Research</i> , 2018, 145, 640-649.	11.3	28
74	Water diffusion and fracture in organosilicate glass film stacks. <i>Acta Materialia</i> , 2007, 55, 2455-2464.	7.9	27
75	Scanning AC nanocalorimetry study of Zr/B reactive multilayers. <i>Journal of Applied Physics</i> , 2013, 114, .	2.5	27
76	First-Principles Theoretical Studies and Nanocalorimetry Experiments on Solid-State Alloying of Zrâ€“B. <i>Nano Letters</i> , 2015, 15, 6553-6558.	9.1	26
77	Measuring the fracture toughness of ultra-thin films with application to AlTa coatings. <i>International Journal of Fracture</i> , 2007, 144, 173-179.	2.2	25
78	Debonding and fracture of ceramic islands on polymer substrates. <i>Journal of Applied Physics</i> , 2012, 111, .	2.5	25
79	Mechanical behavior of poly(methyl methacrylate)-based ionogels. <i>Soft Matter</i> , 2014, 10, 7993-8000.	2.7	24
80	High tensile strength of sputter-deposited ZrB ₂ ceramic thin films measured up to 1016ÅK. <i>Acta Materialia</i> , 2016, 113, 32-40.	7.9	24
81	Application of in-situ nano-scanning calorimetry and X-ray diffraction to characterize Niâ€“Tiâ€“Hf high-temperature shape memory alloys. <i>Thermochimica Acta</i> , 2015, 603, 53-62.	2.7	22
82	Chemically Coupled Interfacial Adhesion in Multimaterial Printing of Hydrogels and Elastomers. <i>ACS Applied Materials & Interfaces</i> , 2020, 12, 31002-31009.	8.0	22
83	Bauschinger effect in thin metal films: Discrete dislocation dynamics study. <i>Journal of Applied Physics</i> , 2014, 115, 013507.	2.5	21
84	Accuracy and Reliability of Bulge Test Experiments. <i>Materials Research Society Symposia Proceedings</i> , 1993, 308, 159.	0.1	20
85	Thickness and film stress effects on the martensitic transformation temperature in equi-atomic NiTi thin films. <i>Mechanics of Materials</i> , 2015, 88, 50-60.	3.2	18
86	Kinetics of solid-gas reactions characterized by scanning AC nano-calorimetry with application to Zr oxidation. <i>Applied Physics Letters</i> , 2014, 105, .	3.3	15
87	Phase transformations in equiatomic CuZr shape memory thin films analyzed by differential nanocalorimetry. <i>Acta Materialia</i> , 2018, 159, 320-331.	7.9	15
88	Electrical resistivity as a descriptor for classification of amorphous versus crystalline phases of alloys. <i>Acta Materialia</i> , 2022, 231, 117861.	7.9	15
89	Diffusion kinetics in binary CuZr and NiZr alloys in the super-cooled liquid and glass states studied by nanocalorimetry. <i>Scripta Materialia</i> , 2019, 165, 73-77.	5.2	14
90	Kinetic Role of Carbon in Solid-State Synthesis of Zirconium Diboride using Nanolaminates: Nanocalorimetry Experiments and First-Principles Calculations. <i>Nano Letters</i> , 2015, 15, 8266-8270.	9.1	13

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91	Blister Test Analysis Methods. Materials Research Society Symposia Proceedings, 1994, 356, 585.	0.1	12
92	A Contact-Mechanics Based Model for Dishing and Erosion in Chemical-Mechanical Polishing. Materials Research Society Symposia Proceedings, 2001, 671, 1.	0.1	12
93	Islands stretch test for measuring the interfacial fracture energy between a hard film and a soft substrate. Journal of Applied Physics, 2013, 113, .	2.5	12
94	Nucleation behavior of melted Bi films at cooling rates from 101 to 104K/s studied by combining scanning AC and DC nano-calorimetry techniques. Thermochimica Acta, 2015, 603, 29-38.	2.7	12
95	Combinatorial temperature resistance sensors for the analysis of phase transformations demonstrated for metallic glasses. Acta Materialia, 2018, 156, 486-495.	7.9	11
96	A Micromachined Picocalorimeter Sensor for Liquid Samples with Application to Chemical Reactions and Biochemistry. Advanced Science, 2021, 8, 2003415.	11.2	11
97	Re-Examining the Bulge Test: Methods for Improving Accuracy and Reliability. Materials Research Society Symposia Proceedings, 1991, 239, 257.	0.1	9
98	Quantitative Interfacial Energy Measurements of Adhesion-Promoted Thin Copper Films by Supercritical Fluid Deposition on Barrier Layers. Journal of Engineering Materials and Technology, Transactions of the ASME, 2010, 132, .	1.4	9
99	Nanocalorimetry and ab initio study of ternary elements in CuZr-based shape memory alloy. Acta Materialia, 2020, 182, 29-38.	7.9	9
100	Parallel nano-Differential Scanning Calorimetry: A New Device for Combinatorial Analysis of Complex nano-Scale Material Systems. Materials Research Society Symposia Proceedings, 2006, 924, 1.	0.1	8
101	Thermal modeling of laser-annealing-induced crystallization of amorphous NiTi thin films. Applied Physics A: Materials Science and Processing, 2008, 90, 689-694.	2.3	8
102	Influence of χ on the elastic properties of organosilicate glasses. Physical Review B, 2011, 83, .	3.2	8
103	Residual stress driven test technique for freestanding ultrathin films: Elastic behavior and residual strain. Journal of Materials Research, 2019, 34, 3474-3482.	2.6	8
104	First-Principles Analysis on the Catalytic Role of Additives in Low-Temperature Synthesis of Transition Metal Diborides Using Nanolaminates. ACS Applied Materials & Interfaces, 2016, 8, 10995-11000.	8.0	6
105	Temperature-resistance sensor arrays for combinatorial study of phase transitions in shape memory alloys and metallic glasses. Scripta Materialia, 2019, 168, 144-148.	5.2	6
106	The effects of passivation layer and film thickness on the mechanical behavior of freestanding electroplated Cu thin films with constant microstructure. Materials Research Society Symposia Proceedings, 2003, 795, 164.	0.1	5
107	T-Stress of a Bi-Material Strip Under Generalized Edge Loads. International Journal of Fracture, 2007, 142, 315-322.	2.2	5
108	Measurement of the stress-strain behavior of freestanding ultra-thin films. Materialia, 2020, 9, 100502.	2.7	5

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109	A Soft Stretchable Sensor: Towards Peripheral Nerve Signal Sensing. MRS Advances, 2018, 3, 1597-1602.	0.9	4
110	Explosive martensitic transformation of supercooled austenite in CuZr-based thin-film shape memory alloys. Acta Materialia, 2020, 200, 162-170.	7.9	4
111	A Finite Element Study on the Nanoindentation of Thin Films. Materials Research Society Symposia Proceedings, 2000, 649, 131.	0.1	2
112	Bottom-up Modeling of the Elastic Properties of Organosilicate Glasses and their Relation to Composition and Network Defects. Materials Research Society Symposia Proceedings, 2011, 1297, 17.	0.1	2
113	Structure and Mechanical Properties of Fe/Zr Multilayers.. Materials Research Society Symposia Proceedings, 1991, 239, 493.	0.1	1
114	Reprint of: Nanocalorimetry: Door opened for in situ material characterization under extreme non-equilibrium conditions. Progress in Materials Science, 2021, 120, 100819.	32.8	1
115	A New Technique For Visualizing The Displacement Field Of Indentations: The Case Of A Soft Film On A Hard Substrate. Materials Research Society Symposia Proceedings, 1997, 505, 71.	0.1	0
116	Microstructure Evolution of On-substrate NiTi Shape Memory Alloy Thin Films. Materials Research Society Symposia Proceedings, 2003, 795, 469.	0.1	0
117	Scanning AC Nanocalorimetry and Its Applications. , 2016, , 205-235.		0
118	Nanomechanical characterization of K-basalt from Roman comagmatic province: A preliminary study. AIP Conference Proceedings, 2018, , .	0.4	0