Marc Legros

List of Publications by Year
in descending order

92 papers	4,723 citations	159585 30 h-index	98798 67 g-index
94 all docs	94 docs citations	94 times ranked	3286 citing authors

#	Article	IF	Citations
1	Stress-assisted discontinuous grain growth and its effect on the deformation behavior of nanocrystalline aluminum thin films. Acta Materialia, 2006, 54, 2253-2263.	7.9	468
2	In situ observation of dislocation nucleation andÂescape in a submicrometre aluminium singleÂcrystal. Nature Materials, 2009, 8, 95-100.	27.5	400
3	Observation of Giant Diffusivity Along Dislocation Cores. Science, 2008, 319, 1646-1649.	12.6	374
4	In situ TEM observations of fast grain-boundary motion in stressed nanocrystalline aluminum films. Acta Materialia, 2008, 56, 3380-3393.	7.9	372
5	Microsample tensile testing of nanocrystalline metals. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 2000, 80, 1017-1026.	0.6	265
6	Grain boundary shearâ€“migration couplingâ€"I. In situ TEM straining experiments in Al polycrystals. Acta Materialia, 2009, 57, 2198-2209.	7.9	179
7	In situ TEM observations of reverse dislocation motion upon unloading in tensile-deformed UFG aluminium. Acta Materialia, 2012, 60, 3402-3414.	7.9	128
8	Atomic-scale simulation of screw dislocation/coherent twin boundary interaction in Al, Au, Cu and Ni. Acta Materialia, 2011, 59, 1456-1463.	7.9	124
9	Elementary Mechanisms of Shear-Coupled Grain Boundary Migration. Physical Review Letters, 2013, 110, 265507.	7.8	121
10	In situ TEM straining of single crystal Au films on polyimide: Change of deformation mechanisms at the nanoscale. Acta Materialia, 2007, 55, 5558-5571.	7.9	116
11	Grain-boundary shear-migration coupling. II. Geometrical model for general boundaries. Acta Materialia, 2009, 57, 2390-2402.	7.9	113
12	Evidence of grain boundary dislocation step motion associated to shear-coupled grain boundary migration. Philosophical Magazine, 2013, 93, 1299-1316.	1.6	109
13	Inter- and intragranular plasticity mechanisms in ultrafine-grained Al thin films: An in situ TEM study. Acta Materialia, 2013, 61, 205-216.	7.9	106
14	Quantitative <i>In Situ</i> Mechanical Testing in Electron Microscopes. MRS Bulletin, 2010, 35, 354-360.	3.5	102
15	The role of disconnections in deformation-coupled grain boundary migration. Acta Materialia, 2014, 77, 223-235.	7.9	90
16	<i>In situ</i>TEM nanomechanics. MRS Bulletin, 2015, 40, 62-70.	3.5	78
17	Source-based strengthening of sub-micrometer Al fibers. Acta Materialia, 2012, 60, 977-983.	7.9	77
18	Quantitative grain growth and rotation probed by in-situ TEM straining and orientation mapping in small grained Al thin films. Scripta Materialia, 2015, 99, 5-8.	5.2	68

#	Article	IF	Citations
19	In situ mechanical TEM: Seeing and measuring under stress with electrons. Comptes Rendus Physique, 2014, 15, 224-240.	0.9	59
20	Microstructural evolution in passivated Al films on Si substrates during thermal cycling. Acta Materialia, 2002, 50, 3435-3452.	7.9	57
21	SMIG model: A new geometrical model to quantify grain boundary-based plasticity. Acta Materialia, 2010, 58, 3676-3689.	7.9	57
22	Direct observation and quantification of grain boundary shear-migration coupling in polycrystalline Al. Journal of Materials Science, 2011, 46, 4308-4313.	3.7	54
23	Identification of Dislocations in Synthetic Chemically Vapor Deposited Diamond Single Crystals. Crystal Growth and Design, 2016, 16, 2741-2746.	3.0	52
24	Disconnections kinks and competing modes in shear-coupled grain boundary migration. Physical Review B, 2016, 93, .	3.2	52
25	Prismatic and basal slip in Ti3Al I. Frictional forces on dislocations. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 1996, 73, 61-80.	0.6	51
26	In situ deformation of thin films on substrates. Microscopy Research and Technique, 2009, 72, 270-283.	2.2	40
27	In situ TEM observation of grain annihilation in tricrystalline aluminum films. Acta Materialia, 2012, 60, 2209-2218.	7.9	38
28	Prismatic and basal slip in Ti3Al II. Dislocation interactions and cross-slip processes. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 1996, 73, 81-99.	0.6	33
29	Shape and Effective Spring Constant of Liquid Interfaces Probed at the Nanometer Scale: Finite Size Effects. Langmuir, 2015, 31, 9790-9798.	3.5	32
30	Evolution of extended defects in polycrystalline UO2 under heavy ion irradiation: combined TEM, XRD and Raman study. Nuclear Instruments & Methods in Physics Research B, 2016, 374, 51-57.	1.4	32
31	Mechanisms of copper direct bonding observed by in-situ and quantitative transmission electron microscopy. Thin Solid Films, 2013, 530, 96-99.	1.8	30
32	Reduction of dislocation densities in single crystal CVD diamond by using self-assembled metallic masks. Diamond and Related Materials, 2015, 58, 62-68.	3.9	29
33	Universal mechanisms of Al metallization ageing in power MOSFET devices. Microelectronics Reliability, 2014, 54, 2432-2439.	1.7	28
34	An in-situ transmission electron microscopy study of pyramidal slip in Ti3Al: I. Geometry and kinetics of glide. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 1997, 76, 995-1011.	0.6	27
35	In-situ TEM straining experiments of Al films on polyimide using a novel FIB design for specimen preparation. Journal of Materials Science, 2006, 41, 4484-4489.	3.7	27
36	Strain compensation by twinning in Au thin films: Experiment and model. Acta Materialia, 2007, 55, 6659-6665.	7.9	27

#	Article	IF	Citations
37	Discerning size effect strengthening in ultrafine-grained Mg thin films. Scripta Materialia, 2014, 75, 10-13.	5.2	27
38	Full characterization of dislocations in ion-irradiated polycrystalline UO2. Journal of Nuclear Materials, 2017, 494, 252-259.	2.7	27
39	Size effects on intergranular crack growth mechanisms in ultrathin nanocrystalline gold free-standing films. Acta Materialia, 2018, 143, 77-87.	7.9	27
40	Dynamic observation of Al thin films plastically strained in a TEM. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2001, 309-310, 463-467.	5.6	26
41	Characterization of alterations on power MOSFET devices under extreme electro-thermal fatigue. Microelectronics Reliability, 2010, 50, 1768-1772.	1.7	26
42	Evolution of extended defects in polycrystalline Au-irradiated UO 2 using in situ TEM: Temperature and fluence effects. Journal of Nuclear Materials, 2016, 482, 105-113.	2.7	26
43	An<i>in-situ</i>transmission electron microscopy study of pyramidal slip in Ti₃Al: II. Fine structure of dislocations and dislocation loops. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 1997, 76, 1013-1032.	0.6	25
44	In-situ observation of deformation micromechanisms in a rafted Î³/Î³â€² superalloy at 850Â°C. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2002, 337, 160-169.	5.6	24
45	Characterization and modelling of ageing failures on power MOSFET devices. Microelectronics Reliability, 2007, 47, 1735-1740.	1.7	24
46	Microstructure and deformation mechanisms in nanocrystalline Niâ€“Fe. Part I. Microstructure. Acta Materialia, 2013, 61, 5835-5845.	7.9	24
47	Characterization of ageing failures on power MOSFET devices by electron and ion microscopies. Microelectronics Reliability, 2009, 49, 1330-1333.	1.7	22
48	Evolution of the nanoporous microstructure of sintered Ag at high temperature using in-situ X-ray nanotomography. Acta Materialia, 2018, 156, 310-317.	7.9	22
49	Quantifying and observing viscoplasticity at the nanoscale: highly localized deformation mechanisms in ultrathin nanocrystalline gold films. Nanoscale, 2016, 8, 9234-9244.	5.6	21
50	Micropillar compression study of Fe-irradiated 304L steel. Scripta Materialia, 2019, 172, 56-60.	5.2	21
51	In situ TEM study of twin boundary migration in sub-micron Be fibers. Acta Materialia, 2015, 96, 57-65.	7.9	19
52	<i>In situ</i> transmission electron microscopy investigation of threading dislocation motion in passivated thin aluminum films. Journal of Materials Research, 1999, 14, 4673-4676.	2.6	18
53	Extended defect change in UO2 during in situ TEM annealing. Acta Materialia, 2020, 196, 240-251.	7.9	17
54	Fatigue of single crystalline silicon: Mechanical behaviour and TEM observations. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2008, 483-484, 353-364.	5.6	16

#	Article	IF	Citations
55	Orientation-related twinning and dislocation glide in a cantor high entropy alloy at room and cryogenic temperature studied by in situ TEM straining. Materials Chemistry and Physics, 2021, 272, 124955.	4.0	16
56	Grain morphology of Cu damascene lines. Microelectronic Engineering, 2010, 87, 383-386.	2.4	14
57	Preparation of H-bar cross-sectional specimen for in situ TEM straining experiments: A FIB-based method applied to a nitrided Tiâ€“6Alâ€“4V alloy. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2011, 528, 1367-1371.	5.6	14
58	Irradiation-assisted stress corrosion cracking susceptibility and mechanical properties related to irradiation-induced microstructures of 304L austenitic stainless steel. Journal of Nuclear Materials, 2020, 528, 151880.	2.7	14
59	Heterogeneous disconnection nucleation mechanisms during grain boundary migration. Physical Review Materials, 2019, 3, .	2.4	14
60	Influence of exogenous xenon atoms on the evolution kinetics of extended defects in polycrystalline UO2 using in situ TEM. Journal of Nuclear Materials, 2018, 512, 297-306.	2.7	13
61	Shear-coupled grain-boundary migration dependence on normal strain/stress. Physical Review Materials, 2017, 1, .	2.4	13
62	Impact of in situ nanomechanics on physical metallurgy. MRS Bulletin, 2019, 44, 465-470.	3.5	12
63	Innovative Methodology for Predictive Reliability of Intelligent Power Devices Using Extreme Electro-thermal Fatigue. Microelectronics Reliability, 2005, 45, 1717-1722.	1.7	11
64	Pattern size dependence of grain growth in Cu interconnects. Scripta Materialia, 2010, 63, 965-968.	5.2	11
65	3D nanostructural characterisation of grain boundaries in atom probe data utilising machine learning methods. PLoS ONE, 2019, 14, e0225041.	2.5	11
66	Impact of thermal cycling on the evolution of grain, precipitate and dislocation structure in Al, 0.5% Cu, 1% Si thin films. Microelectronic Engineering, 2003, 70, 447-454.	2.4	10
67	Absorption of crystal/amorphous interfacial dislocations during in situ TEM nanoindentation of an Al thin film on Si. Scripta Materialia, 2014, 74, 44-47.	5.2	10
68	In-depth investigation of metallization aging in power MOSFETs. Microelectronics Reliability, 2015, 55, 1966-1970.	1.7	10
69	Subgrains, micro-twins and dislocations characterization in monolike Si using TEM and in-situ TEM. Materials Today: Proceedings, 2018, 5, 14732-14747.	1.8	10
70	Plasticity Mechanisms in Subâ€Micron Al Fiber Investigated by In Situ TEM. Advanced Engineering Materials, 2012, 14, 955-959.	3.5	9
71	Fatigue testing of single crystalline silicon. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2001, 309-310, 233-236.	5.6	8
72	Pipe-diffusion ripening of Si precipitates in Al-0.5%Cu-1%Si thin films. Philosophical Magazine, 2005, 85, 3541-3552.	1.6	8

#	Article	IF	Citations
73	Mechanisms of power module source metal degradation during electro-thermal aging. Microelectronics Reliability, 2017, 76-77, 507-511.	1.7	8
74	Multiple coupling modes to relax shear strain during grain boundary migration. Acta Materialia, 2021, 218, 117222.	7.9	8
75	Spatial distribution of structural defects in Cz-seeded directionally solidified silicon ingots: An etch pit study. Journal of Crystal Growth, 2018, 483, 183-189.	1.5	8
76	Low-cycle fatigue in silicon: comparison with fcc metals. Fatigue and Fracture of Engineering Materials and Structures, 2007, 30, 41-56.	3.4	7
77	In situ observations of unusual dislocation mechanisms in the intermetallic alloy Ti3Al. Journal of Microscopy, 2001, 203, 90-98.	1.8	6
78	Plasticity-Related Phenomena in Metallic Films on Substrates. Materials Research Society Symposia Proceedings, 2003, 779, 421.	0.1	6
79	In-Situ TEM Study of Plastic Stress Relaxation Mechanisms and Interface Effects in Metallic Films. Materials Research Society Symposia Proceedings, 2005, 875, 1.	0.1	6
80	Aluminum metallization and wire bonding aging in power MOSFET modules. Materials Today: Proceedings, 2018, 5, 14641-14651.	1.8	6
81	An in situ study at room temperature of deformation processes in a Ti-23.7Al-9.4Nb alloy. Intermetallics, 1996, 4, 387-401.	3.9	5
82	Mechanical behaviour and dislocation arrangements of cyclically deformed silicon single crystals. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 2002, 82, 3275-3288.	0.6	4
83	Fatigue testing and the evolution of the defect microstructure in Si single crystals by transmission electron microscopy. Journal of Physics Condensed Matter, 2002, 14, 12871-12882.	1.8	4
84	Alterations induced in the structure of intelligent power devices by extreme electro-thermal fatigue. Physica Status Solidi C: Current Topics in Solid State Physics, 2007, 4, 2997-3001.	0.8	4
85	Role of sessile disconnection dipoles in shear-coupled grain boundary migration. Physical Review Materials, 2020, 4, .	2.4	4
86	In Situ Deformation at 850Â°C of Standard and Rafted Microstructures of Nickel Base Superalloys. Materials Science Forum, 2006, 509, 57-62.	0.3	3
87	Shear-coupled migration of grain boundaries: the key missing link in the mechanical behavior of small-grained metals?. Comptes Rendus Physique, 2021, 22, 19-34.	0.9	2
88	Deformation mechanisms in submicron Be wires. Journal of Materials Research, 2017, 32, 4616-4625.	2.6	2
89	Size-Induced Transition from Perfect to Partial Dislocation Plasticity in Single Crystal Au Films on Polyimide. Microscopy and Microanalysis, 2007, 13, 278-279.	0.4	1
90	Some applications of nanometer scale structures for current and future X-ray space research. Journal De Physique III, 1994, 4, 1599-1612.	0.3	1

#	Article	IF	Citations
91	Tiny but mighty: Size effects on the strength of metals. , 2016, , .		0
92	The effect of electro-thermal fatigue on the structure of power electronic devices. Micro-structural evolution of the metallization layer. International Journal of Materials Research, 2009, 100, 1178-1181.	0.3	0