

Howard M Branz

List of Publications by Year in descending order

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111
papers

3,902
citations

159585

30
h-index

123424

61
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111
all docs

111
docs citations

111
times ranked

3738
citing authors

#	ARTICLE	IF	CITATIONS
1	An 18.2%-efficient black-silicon solar cell achieved through control of carrier recombination in nanostructures. <i>Nature Nanotechnology</i> , 2012, 7, 743-748.	31.5	836
2	Efficient black silicon solar cell with a density-graded nanoporous surface: Optical properties, performance limitations, and design rules. <i>Applied Physics Letters</i> , 2009, 95, .	3.3	286
3	Nanostructured black silicon and the optical reflectance of graded-density surfaces. <i>Applied Physics Letters</i> , 2009, 94, .	3.3	280
4	Hydrogen collision model: Quantitative description of metastability in amorphous silicon. <i>Physical Review B</i> , 1999, 59, 5498-5512.	3.2	229
5	Nanoporous black silicon photocathode for H ₂ production by photoelectrochemical water splitting. <i>Energy and Environmental Science</i> , 2011, 4, 1690.	30.8	221
6	Potential fluctuations due to inhomogeneity in hydrogenated amorphous silicon and the resulting charged dangling-bond defects. <i>Physical Review B</i> , 1990, 42, 7420-7428.	3.2	141
7	Multi-scale surface texture to improve blue response of nanoporous black silicon solar cells. <i>Applied Physics Letters</i> , 2011, 99, 103501.	3.3	138
8	Stand-alone photovoltaic-powered electrochromic smart window. <i>Electrochimica Acta</i> , 2001, 46, 2125-2130.	5.2	105
9	Angle-Resolved XPS Analysis and Characterization of Monolayer and Multilayer Silane Films for DNA Coupling to Silica. <i>Langmuir</i> , 2013, 29, 4057-4067.	3.5	89
10	Hydrogen collision model of light-induced metastability in hydrogenated amorphous silicon. <i>Solid State Communications</i> , 1998, 105, 387-391.	1.9	85
11	Reformulation of solar cell physics to facilitate experimental separation of recombination pathways. <i>Applied Physics Letters</i> , 2013, 103, .	3.3	78
12	Exciton splitting and carrier transport across the amorphous-silicon/polymer solar cell interface. <i>Applied Physics Letters</i> , 2006, 89, 252102.	3.3	71
13	Light-enhanced deep deuterium emission and the diffusion mechanism in amorphous silicon. <i>Physical Review B</i> , 1993, 47, 7061-7066.	3.2	56
14	Efficient nanostructured "black" silicon solar cell by copper-catalyzed metal-assisted etching. <i>Progress in Photovoltaics: Research and Applications</i> , 2015, 23, 1375-1380.	8.1	55
15	Exciton harvesting, charge transfer, and charge-carrier transport in amorphous-silicon nanopillar/polymer hybrid solar cells. <i>Journal of Applied Physics</i> , 2008, 103, 064511.	2.5	53
16	Hydrogen diffusion and mobile hydrogen in amorphous silicon. <i>Physical Review B</i> , 1999, 60, 7725-7727.	3.2	50
17	Dangling bonds in doped amorphous silicon: Equilibrium, relaxation, and transition energies. <i>Physical Review B</i> , 1989, 39, 5107-5115.	3.2	47
18	Dangling-bond relaxation and deep-level measurements in hydrogenated amorphous silicon. <i>Physical Review B</i> , 1993, 48, 8667-8671.	3.2	45

#	ARTICLE	IF	CITATIONS
19	Proton Reduction Using a Hydrogenase-Modified Nanoporous Black Silicon Photoelectrode. ACS Applied Materials & Interfaces, 2016, 8, 14481-14487.	8.0	44
20	Material quality requirements for efficient epitaxial film silicon solar cells. Applied Physics Letters, 2010, 96, 073502.	3.3	43
21	Heteroepitaxial film silicon solar cell grown on Ni-W foils. Energy and Environmental Science, 2012, 5, 6052.	30.8	40
22	Capacitance-spectroscopy identification of a key defect in N-degraded GaInNAs solar cells. Applied Physics Letters, 2005, 86, 113506.	3.3	39
23	Atomic structure and electronic properties of c-Si/a-Si:H heterointerfaces. Applied Physics Letters, 2006, 88, 121925.	3.3	39
24	Hot-wire chemical vapor deposition of epitaxial film crystal silicon for photovoltaics. Thin Solid Films, 2011, 519, 4545-4550.	1.8	38
25	On the superlinear increase in conductivity with dopant concentration in excitonic semiconductors. Applied Physics Letters, 2004, 84, 1707-1709.	3.3	36
26	Monitoring and modeling silicon homoepitaxy breakdown with real-time spectroscopic ellipsometry. Journal of Applied Physics, 2005, 97, 103536.	2.5	36
27	Explanation of the limiting thickness observed in low-temperature silicon epitaxy. Applied Physics Letters, 2000, 77, 3589-3591.	3.3	35
28	Light trapping by a dielectric nanoparticle back reflector in film silicon solar cells. Applied Physics Letters, 2011, 99, 064101.	3.3	34
29	Hydrogen above Saturation at Silicon Vacancies: H-Pair Reservoirs and Metastability Sites. Physical Review Letters, 2001, 87, 105503.	7.8	33
30	Heteroepitaxial film crystal silicon on Al ₂ O ₃ : new route to inexpensive crystal silicon photovoltaics. Energy and Environmental Science, 2011, 4, 3346.	30.8	33
31	Light-induced D diffusion measurements in hydrogenated amorphous silicon: Testing H metastability models. Physical Review B, 1999, 59, 5513-5520.	3.2	31
32	Biaxially-textured photovoltaic film crystal silicon on ion beam assisted deposition CaF ₂ seed layers on glass. Energy and Environmental Science, 2012, 5, 6905.	30.8	30
33	Significant improvement in silicon chemical vapor deposition epitaxy above the surface dehydrogenation temperature. Journal of Applied Physics, 2006, 100, 093520.	2.5	29
34	Hydrogen diffusion in a-Si:H: Solution of the tracer equations including capture by exchange. Physical Review B, 1995, 52, 13946-13954.	3.2	28
35	The hydrogen collision model of metastability after 5 years: experimental tests and theoretical extensions. Solar Energy Materials and Solar Cells, 2003, 78, 425-445.	6.2	26
36	High-Resolution X-ray Photoelectron Spectroscopy of Mixed Silane Monolayers for DNA Attachment. ACS Applied Materials & Interfaces, 2011, 3, 3285-3292.	8.0	25

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37	Monolithic, Self-Powered Photovoltaic-Electrochromic Coating for Windows. Journal of the Electrochemical Society, 1998, 145, 3545-3550.	2.9	23
38	Mechanisms controlling the phase and dislocation density in epitaxial silicon films grown from silane below 800°C. Applied Physics Letters, 2010, 96, .	3.3	23
39	Nonradiative Electron-Hole Recombination by a Low-Barrier Pathway in Hydrogenated Silicon Semiconductors. Physical Review Letters, 2000, 84, 967-970.	7.8	21
40	Pyramidal light trapping and hydrogen passivation for high-efficiency heteroepitaxial (100) crystal silicon solar cells. Energy and Environmental Science, 2012, 5, 8193.	30.8	21
41	Electron beam creation of metastable defects in hydrogenated amorphous silicon: hydrogen collision model. Journal of Non-Crystalline Solids, 2000, 266-269, 437-443.	3.1	17
42	Anneal treatment to reduce the creation rate of light-induced metastable defects in device-quality hydrogenated amorphous silicon. Applied Physics Letters, 2011, 98, 201908.	3.3	17
43	Fermi-level dependence of the charge state of diffusing hydrogen in amorphous silicon. Journal of Non-Crystalline Solids, 2002, 299-302, 191-195.	3.1	15
44	Cone kinetics model for two-phase film silicon deposition. Applied Physics Letters, 2008, 92, 093114.	3.3	15
45	Excellent passivation and low reflectivity Al ₂ O ₃ /TiO ₂ bilayer coatings for n-wafer silicon solar cells. , 2012, , .		14
46	Fingerprints of two distinct defects causing light-induced photoconductivity degradation in hydrogenated amorphous silicon. Applied Physics Letters, 2001, 79, 3080-3082.	3.3	13
47	Solid phase crystallization of hot-wire CVD amorphous silicon films. Materials Research Society Symposia Proceedings, 2005, 862, 1051.	0.1	12
48	Physics and chemistry of hot-wire chemical vapor deposition from silane: Measuring and modeling the silicon epitaxy deposition rate. Journal of Applied Physics, 2010, 107, 054906.	2.5	12
49	Efficient 18 Å/s Solar Cells with All Silicon Layers Deposited by Hot-Wire Chemical Vapor Deposition. Materials Research Society Symposia Proceedings, 2000, 609, 431.	0.1	11
50	The hydrogen collision model: theory and experiment. Journal of Non-Crystalline Solids, 2000, 266-269, 391-396.	3.1	11
51	Comment on "Excitation-energy dependence of optically induced ESR in a-Si:H". Physical Review B, 1990, 41, 7887-7890.	3.2	10
52	Electron transport and band structure in phosphorus-doped polycrystalline silicon films. Journal of Applied Physics, 2009, 105, 033715.	2.5	10
53	Comparison of thin epitaxial film silicon photovoltaics fabricated on monocrystalline and polycrystalline seed layers on glass. Progress in Photovoltaics: Research and Applications, 2015, 23, 909-917.	8.1	9
54	Physics of the Meyer-Neldel Rule in Amorphous Silicon. Materials Research Society Symposia Proceedings, 1994, 336, 159.	0.1	8

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55	Improved stability of hydrogenated amorphous-silicon photosensitivity by ultraviolet illumination. Applied Physics Letters, 2002, 81, 3353-3355.	3.3	8
56	Real Time Monitoring of the Crystallization of Hydrogenated Amorphous Silicon. Materials Research Society Symposia Proceedings, 2005, 862, 1611.	0.1	8
57	Epitaxial crystal silicon absorber layers and solar cells grown at 1.8 microns per minute. , 2011, , .		8
58	Device Physics of Heteroepitaxial Film c-Si Heterojunction Solar Cells. IEEE Journal of Photovoltaics, 2013, 3, 230-235.	2.5	8
59	Structural Changes in a-Si:H Studied by X-Ray Photoemission Spectroscopy. Materials Research Society Symposia Proceedings, 1999, 557, 359.	0.1	7
60	Hydrogen Diffusion Mechanism in Amorphous Silicon From D Tracer Diffusion: Theory and Experiment. Materials Research Society Symposia Proceedings, 1993, 297, 279.	0.1	6
61	Structural Relaxation and Structural Memory at Amorphous Silicon Dangling Bonds. Materials Research Society Symposia Proceedings, 1994, 336, 129.	0.1	6
62	Comparative Study of Solid-Phase Crystallization of Amorphous Silicon Deposited by Hot-wire CVD, Plasma-Enhanced CVD, and Electron-Beam Evaporation. Materials Research Society Symposia Proceedings, 2007, 989, 4.	0.1	6
63	Dislocation-limited open circuit voltage in film crystal silicon solar cells. Applied Physics Letters, 2012, 101, 123510.	3.3	6
64	Measurement of electric-field induced second harmonic generation in hydrogenated amorphous silicon. Applied Physics Letters, 2012, 101, 161604.	3.3	6
65	Switching Behavior in p-Type Hydrogenated Amorphous Silicon with One and Two Blocking Contacts. Materials Research Society Symposia Proceedings, 2002, 715, 1221.	0.1	5
66	Silicon homoepitaxy using tantalum-filament hot-wire chemical vapor deposition. Materials Research Society Symposia Proceedings, 2005, 862, 231.	0.1	5
67	Efficient black silicon solar cells with nanoporous anti-reflection made in a single-step liquid etch. , 2009, , .		5
68	Light trapping for thin silicon solar cells by femtosecond laser texturing. , 2012, , .		5
69	Novel Micropixelation Strategy to Stabilize Semiconductor Photoelectrodes for Solar Water Splitting Systems. Journal of Physical Chemistry C, 2012, 116, 19262-19267.	3.1	5
70	On Modeling Trivalent Dangling Bonds with Bivalent Levels. Materials Research Society Symposia Proceedings, 1994, 336, 153.	0.1	4
71	Evidence for Exchange Between Free and Deep Hydrogen (Deuterium) During Diffusion. Materials Research Society Symposia Proceedings, 1995, 377, 331.	0.1	4
72	Hydrogen Collision Model of The Staebler-Wronski Effect: Microscopics and Kinetics. Materials Research Society Symposia Proceedings, 1998, 507, 709.	0.1	4

#	ARTICLE	IF	CITATIONS
73	600 mV epitaxial crystal silicon solar cells grown on seeded glass. , 2013, , .		4
74	Improved Monolithic Photovoltaic-Electrochromic Devices Incorporating an a-SiC:H Solar Cell. Materials Research Society Symposia Proceedings, 1996, 420, 183.	0.1	3
75	Microstructure and surface chemistry of nanoporous “black silicon” for photovoltaics. , 2010, , .		3
76	Junction transport in epitaxial film silicon heterojunction solar cells. , 2011, , .		3
77	Antireflection and SiO$\text{inf}>2$/$\text{inf}>2$ surface passivation by liquid-phase chemistry for efficient black silicon solar cells. , 2012, , .		3
78	Observation of Metastability in Amorphous Silicon Containing 0.1 at.% Hydrogen. Materials Research Society Symposia Proceedings, 1992, 258, 389.	0.1	2
79	On the lack of observable light-induced H diffusion near room temperature. Journal of Non-Crystalline Solids, 1996, 198-200, 441-444.	3.1	2
80	Slow Degradation of Hydrogenated Amorphous Silicon Photoconductivity Under Pulsed Illumination. Materials Research Society Symposia Proceedings, 1999, 557, 347.	0.1	2
81	New experiments on the relationship between light-induced defects and photoconductivity degradation. Materials Research Society Symposia Proceedings, 2001, 664, 1221.	0.1	2
82	Hydrogen Equilibration and Metastability in Amorphous Silicon. Materials Research Society Symposia Proceedings, 2001, 664, 1331.	0.1	2
83	Area-Dependent Switching in Thin Film-Silicon Devices. Materials Research Society Symposia Proceedings, 2003, 762, 1831.	0.1	2
84	Pulsed-illumination study of metastable defect creation time scales in hydrogenated amorphous silicon. Physical Review B, 2004, 69, .	3.2	2
85	The Effect of Oxygen Contamination on the Electronic Properties of Hot-Wire CVD Amorphous Silicon Germanium Alloys. Materials Research Society Symposia Proceedings, 2006, 910, 5.	0.1	2
86	Physics of Solid-Phase Epitaxy of Hydrogenated Amorphous Silicon for Thin Film Si Photovoltaics. Materials Research Society Symposia Proceedings, 2006, 910, 5.	0.1	2
87	Roughness, impurities and strain in low-temperature epitaxial silicon films grown by tantalum filament hot-wire chemical vapor deposition. Materials Research Society Symposia Proceedings, 2006, 910, 1.	0.1	2
88	Dependence of the Electronic Properties of Hot-Wire CVD Amorphous Silicon-Germanium Alloys on Oxygen Impurity Levels. Materials Research Society Symposia Proceedings, 2007, 989, 3.	0.1	2
89	Silicon solar cells with front hetero-contact and aluminum alloy back junction. Conference Record of the IEEE Photovoltaic Specialists Conference, 2008, , .	0.0	2
90	New Results on Enhanced Deuterium Diffusion Under Illumination in Amorphous Silicon. Materials Research Society Symposia Proceedings, 1992, 258, 431.	0.1	1

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91	Wide GAP a-SiC:H Alloys for Novel Photovoltaic-Electrochromic Window Coatings. Materials Research Society Symposia Proceedings, 1995, 377, 589.	0.1	1
92	Light Bias CPM Study of the Density of States in N-type Amorphous Silicon. Materials Research Society Symposia Proceedings, 1996, 420, 703.	0.1	1
93	Hydrogen Diffusion in the Hydrogen Collision Model of Amorphous Silicon Metastability. Materials Research Society Symposia Proceedings, 1999, 557, 377.	0.1	1
94	Metastable defects by low-intensity pulsed illumination of hydrogenated amorphous silicon. Materials Research Society Symposia Proceedings, 2000, 609, 321.	0.1	1
95	Phase evolution in nanocrystalline silicon films: Hydrogen dilution and the cone kinetics model. Philosophical Magazine, 2009, 89, 2461-2468.	1.6	1
96	Photovoltaic device characterization with optical second harmonic generation. , 2010, , .		1
97	Device physics of heteroepitaxial film c-Si heterojunction solar cells. , 2012, , .		1
98	Improved 750 °C epitaxial crystal silicon solar cells through impurity reduction. , 2013, , .		1
99	Amorphous to Microcrystalline Transition in Thickness-graded Hot-Wire CVD Silicon Films. Materials Research Society Symposia Proceedings, 2002, 715, 1711.	0.1	1
100	Monte Carlo Simulations of Defect Relaxation in Amorphous Silicon. Materials Research Society Symposia Proceedings, 1995, 377, 293.	0.1	0
101	New microscopic model of the Staebler-Wronski effect in hydrogenated amorphous silicon. , 1999, , .		0
102	Determination of the Mobile-Hydrogen Charge State in Hydrogenated Amorphous Silicon. Materials Research Society Symposia Proceedings, 2001, 664, 2821.	0.1	0
103	Photoconductivity Stability Improvement in Hydrogenated Amorphous Silicon by Ultraviolet Illumination. Materials Research Society Symposia Proceedings, 2002, 715, 19111.	0.1	0
104	Increase of temperature and crystallinity during electrical switching in microcrystalline silicon. Materials Research Society Symposia Proceedings, 2004, 808, 185.	0.1	0
105	Combinatorial Studies of Switching and Solid-Phase Crystallization in Amorphous Silicon. Materials Research Society Symposia Proceedings, 2005, 894, 1.	0.1	0
106	Materials Optimization for Silicon Heterojunction Solar Cells Using Spectroscopic Ellipsometry. Materials Research Society Symposia Proceedings, 2007, 989, 4.	0.1	0
107	Photovoltaic-quality silicon epitaxy by hot-wire CVD at glasscompatible temperatures. , 2009, , .		0
108	Epitaxial film silicon solar cells fabricated by hot wire chemical vapor deposition below 750°C. , 2009, , .		0

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109	Reduced light-induced degradation in a-Si:H: The role of network nanostructure. , 2011, , .		0
110	New analysis of suns- V_{oc} and $V_{oc}(T)$: A simple method to quantify recombination channels in solar cells. , 2013, , .		0
111	Device physics of heteroepitaxial film c-Si heterojunction solar cells. , 2013, , .		0