Howard M Branz

List of Publications by Citations

104 papers	3,404 citations	29 h-index	57 g-index
111 ext. papers	3,723 ext. citations	6.9 avg, IF	5.31 L-index

#	Paper	IF	Citations
104	An 18.2%-efficient black-silicon solar cell achieved through control of carrier recombination in nanostructures. *Nature Nanotechnology*, **2012**, 7, 743-8	28.7	678
103	Efficient black silicon solar cell with a density-graded nanoporous surface: Optical properties, performance limitations, and design rules. *Applied Physics Letters*, **2009**, 95, 123501	3.4	254
102	Nanostructured black silicon and the optical reflectance of graded-density surfaces. *Applied Physics Letters*, **2009**, 94, 231121	3.4	253
101	Hydrogen collision model: Quantitative description of metastability in amorphous silicon. *Physical Review B*, **1999**, 59, 5498-5512	3.3	206
100	Nanoporous black silicon photocathode for H2 production by photoelectrochemical water splitting. *Energy and Environmental Science*, **2011**, 4, 1690	35.4	199
99	Potential fluctuations due to inhomogeneity in hydrogenated amorphous silicon and the resulting charged dangling-bond defects. *Physical Review B*, **1990**, 42, 7420-7428	3.3	133
98	Multi-scale surface texture to improve blue response of nanoporous black silicon solar cells. *Applied Physics Letters*, **2011**, 99, 103501	3.4	126
97	Stand-alone photovoltaic-powered electrochromic smart window. *Electrochimica Acta*, **2001**, 46, 2125-2139	3.7	93
96	Hydrogen collision model of light-induced metastability in hydrogenated amorphous silicon. *Solid State Communications*, **1998**, 105, 387-391	1.6	78
95	Angle-resolved XPS analysis and characterization of monolayer and multilayer silane films for DNA coupling to silica. *Langmuir*, **2013**, 29, 4057-67	4	72
94	Exciton splitting and carrier transport across the amorphous-silicon/polymer solar cell interface. *Applied Physics Letters*, **2006**, 89, 252102	3.4	67
93	Light-enhanced deep deuterium emission and the diffusion mechanism in amorphous silicon. *Physical Review B*, **1993**, 47, 7061-7066	3.3	56
92	Reformulation of solar cell physics to facilitate experimental separation of recombination pathways. *Applied Physics Letters*, **2013**, 103, 093502	3.4	53
91	Exciton harvesting, charge transfer, and charge-carrier transport in amorphous-silicon nanopillar/polymer hybrid solar cells. *Journal of Applied Physics*, **2008**, 103, 064511	2.5	50
90	Dangling bonds in doped amorphous silicon: Equilibrium, relaxation, and transition energies. *Physical Review B*, **1989**, 39, 5107-5115	3.3	47
89	Efficient nanostructured black-silicon solar cell by copper-catalyzed metal-assisted etching. *Progress in Photovoltaics: Research and Applications*, **2015**, 23, 1375-1380	6.8	46
88	Hydrogen diffusion and mobile hydrogen in amorphous silicon. *Physical Review B*, **1999**, 60, 7725-7727	3.3	46

87	Dangling-bond relaxation and deep-level measurements in hydrogenated amorphous silicon. *Physical Review B*, **1993**, 48, 8667-8671	3.3	42
86	Material quality requirements for efficient epitaxial film silicon solar cells. *Applied Physics Letters*, **2010**, 96, 073502	3.4	37
85	Atomic structure and electronic properties of c-Si□-Si:H heterointerfaces. *Applied Physics Letters*, **2006**, 88, 121925	3.4	36
84	Heteroepitaxial film silicon solar cell grown on Ni-W foils. *Energy and Environmental Science*, **2012**, 5, 6052	35.4	35
83	Explanation of the limiting thickness observed in low-temperature silicon epitaxy. *Applied Physics Letters*, **2000**, 77, 3589-3591	3.4	35
82	Monitoring and modeling silicon homoepitaxy breakdown with real-time spectroscopic ellipsometry. *Journal of Applied Physics*, **2005**, 97, 103536	2.5	34
81	Proton Reduction Using a Hydrogenase-Modified Nanoporous Black Silicon Photoelectrode. *ACS Applied Materials & Interfaces*, **2016**, 8, 14481-7	9.5	33
80	Hot-wire chemical vapor deposition of epitaxial film crystal silicon for photovoltaics. *Thin Solid Films* , **2011**, 519, 4545-4550	2.2	33
79	Heteroepitaxial film crystal silicon on Al2O3: new route to inexpensive crystal silicon photovoltaics. *Energy and Environmental Science*, **2011**, 4, 3346	35.4	32
78	On the superlinear increase in conductivity with dopant concentration in excitonic semiconductors. *Applied Physics Letters*, **2004**, 84, 1707-1709	3.4	32
77	Hydrogen above saturation at silicon vacancies: H-pair reservoirs and metastability sites. *Physical Review Letters*, **2001**, 87, 105503	7.4	31
76	Capacitance-spectroscopy identification of a key defect in N-degraded GaInNAs solar cells. *Applied Physics Letters*, **2005**, 86, 113506	3.4	29
75	Light-induced D diffusion measurements in hydrogenated amorphous silicon: Testing H metastability models. *Physical Review B*, **1999**, 59, 5513-5520	3.3	28
74	Hydrogen diffusion in a-Si:H: Solution of the tracer equations including capture by exchange. *Physical Review B*, **1995**, 52, 13946-13954	3.3	28
73	Light trapping by a dielectric nanoparticle back reflector in film silicon solar cells. *Applied Physics Letters*, **2011**, 99, 064101	3.4	27
72	Significant improvement in silicon chemical vapor deposition epitaxy above the surface dehydrogenation temperature. *Journal of Applied Physics*, **2006**, 100, 093520	2.5	26
71	Biaxially-textured photovoltaic film crystal silicon on ion beam assisted deposition CaF2 seed layers on glass. *Energy and Environmental Science*, **2012**, 5, 6905	35.4	25
70	Monolithic, Self-Powered Photovoltaic-Electrochromic Coating for Windows. *Journal of the Electrochemical Society*, **1998**, 145, 3545-3550	3.9	22

69	The hydrogen collision model of metastability after 5 years: experimental tests and theoretical extensions. *Solar Energy Materials and Solar Cells*, **2003**, 78, 425-445	6.4	21
68	Pyramidal light trapping and hydrogen passivation for high-efficiency heteroepitaxial (100) crystal silicon solar cells. *Energy and Environmental Science*, **2012**, 5, 8193	35.4	20
67	High-resolution X-ray photoelectron spectroscopy of mixed silane monolayers for DNA attachment. *ACS Applied Materials & Interfaces*, **2011**, 3, 3285-92	9.5	20
66	Nonradiative electron-hole recombination by a low-barrier pathway in hydrogenated silicon semiconductors. *Physical Review Letters*, **2000**, 84, 967-70	7.4	19
65	Mechanisms controlling the phase and dislocation density in epitaxial silicon films grown from silane below 800 °C. *Applied Physics Letters*, **2010**, 96, 201901	3.4	17
64	Electron beam creation of metastable defects in hydrogenated amorphous silicon: hydrogen collision model. *Journal of Non-Crystalline Solids*, **2000**, 266-269, 437-443	3.9	16
63	Cone kinetics model for two-phase film silicon deposition. *Applied Physics Letters*, **2008**, 92, 093114	3.4	15
62	Fermi-level dependence of the charge state of diffusing hydrogen in amorphous silicon. *Journal of Non-Crystalline Solids*, **2002**, 299-302, 191-195	3.9	13
61	Excellent passivation and low reflectivity Al2O3 /TiO2 bilayer coatings for n-wafer silicon solar cells **2012**,		11
60	Fingerprints of two distinct defects causing light-induced photoconductivity degradation in hydrogenated amorphous silicon. *Applied Physics Letters*, **2001**, 79, 3080-3082	3.4	11
59	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	10
58	Electron transport and band structure in phosphorus-doped polycrystalline silicon films. *Journal of Applied Physics*, **2009**, 105, 033715	2.5	10
57	Anneal treatment to reduce the creation rate of light-induced metastable defects in device-quality hydrogenated amorphous silicon. *Applied Physics Letters*, **2011**, 98, 201908	3.4	10
56	Comment on "Excitation-energy dependence of optically induced ESR in a-Si:H". *Physical Review B*, **1990**, 41, 7887-7890	3.3	10
55	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	6.8	9
54	Solid phase crystallization of hot-wire CVD amorphous silicon films. *Materials Research Society Symposia Proceedings*, **2005**, 862, 1051		9
53	Efficient 18 % Solar Cells with All Silicon Layers Deposited by Hot-Wire Chemical Vapor Deposition. *Materials Research Society Symposia Proceedings*, **2000**, 609, 431		9
52	Improved stability of hydrogenated amorphous-silicon photosensitivity by ultraviolet illumination. *Applied Physics Letters*, **2002**, 81, 3353-3355	3.4	8

51	The hydrogen collision model: theory and experiment. *Journal of Non-Crystalline Solids*, **2000**, 266-269, 391-396	3.9	8
50	Device Physics of Heteroepitaxial Film c-Si Heterojunction Solar Cells. *IEEE Journal of Photovoltaics*, **2013**, 3, 230-235	3.7	7
49	Physics of the Meyer-Neldel Rule in Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **1994**, 336, 159		7
48	Epitaxial crystal silicon absorber layers and solar cells grown at 1.8 microns per minute **2011**,		6
47	Dislocation-limited open circuit voltage in film crystal silicon solar cells. *Applied Physics Letters*, **2012**, 101, 123510	3.4	6
46	Measurement of electric-field induced second harmonic generation in hydrogenated amorphous silicon. *Applied Physics Letters*, **2012**, 101, 161604	3.4	6
45	Real Time Monitoring of the Crystallization of Hydrogenated Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **2005**, 862, 1611		6
44	Structural Changes in a-Si:H Studied by X-Ray Photoemission Spectroscopy. *Materials Research Society Symposia Proceedings*, **1999**, 557, 359		6
43	Structural Relaxation and Structural Memory at Amorphous Silicon Dangling Bonds. *Materials Research Society Symposia Proceedings*, **1994**, 336, 129		6
42	Novel Micropixelation Strategy to Stabilize Semiconductor Photoelectrodes for Solar Water Splitting Systems. *Journal of Physical Chemistry C*, **2012**, 116, 19262-19267	3.8	5
41	Efficient black silicon solar cells with nanoporous anti-reflection made in a single-step liquid etch **2009**,		5
40	Switching Behavior in p-Type Hydrogenated Amorphous Silicon with One and Two Blocking Contacts. *Materials Research Society Symposia Proceedings*, **2002**, 715, 1221		5
39	Hydrogen Diffusion Mechanism in Amorphous Silicon from D Tracer Diffusion: Theory and Experiment. *Materials Research Society Symposia Proceedings*, **1993**, 297, 279		5
38	600 mV epitaxial crystal silicon solar cells grown on seeded glass **2013**,		4
37	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		4
36	Silicon homoepitaxy using tantalum-filament hot-wire chemical vapor deposition. *Materials Research Society Symposia Proceedings*, **2005**, 862, 231		4
35	Hydrogen Collision Model of The Staebler-Wronski Effect: Microscopics and Kinetics. *Materials Research Society Symposia Proceedings*, **1998**, 507, 709		4
34	On Modeling Trivalent Dangling Bonds with Bivalent Levels. *Materials Research Society Symposia Proceedings*, **1994**, 336, 153		4

33	Microstructure and surface chemistry of nanoporous "black silicon" for photovoltaics **2010**,		3
32	Improved Monolithic Photovoltaic-Electrochromic Devices Incorporating an a-SiC:H Solar Cell. *Materials Research Society Symposia Proceedings*, **1996**, 420, 183		3
31	Evidence for Exchange Between Free and Deep Hydrogen (Deuterium) During Diffusion. *Materials Research Society Symposia Proceedings*, **1995**, 377, 331		3
30	Silicon solar cells with front hetero-contact and aluminum alloy back junction. *Conference Record of the IEEE Photovoltaic Specialists Conference*, **2008**,		2
29	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		2
28	Physics of Solid-Phase Epitaxy of Hydrogenated Amorphous Silicon for Thin Film Si Photovoltaics. *Materials Research Society Symposia Proceedings*, **2006**, 910, 5		2
27	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		2
26	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		2
25	Area-Dependent Switching in Thin Film-Silicon Devices. *Materials Research Society Symposia Proceedings*, **2003**, 762, 1831		2
24	New experiments on the relationship between light-induced defects and photoconductivity degradation. *Materials Research Society Symposia Proceedings*, **2001**, 664, 1221		2
23	Hydrogen Equilibration and Metastability in Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **2001**, 664, 1331		2
22	Slow Degradation of Hydrogenated Amorphous Silicon Photoconductivity Under Pulsed Illumination. *Materials Research Society Symposia Proceedings*, **1999**, 557, 347		2
21	On the lack of observable light-induced H diffusion near room temperature. *Journal of Non-Crystalline Solids*, **1996**, 198-200, 441-444	3.9	2
20	Observation of Metastability in Amorphous Silicon Containing 0.1 at.% Hydrogen. *Materials Research Society Symposia Proceedings*, **1992**, 258, 389		2
19	Improved 750 °C epitaxial crystal silicon solar cells through impurity reduction **2013**,		1
18	Light trapping for thin silicon solar cells by femtosecond laser texturing **2012**,		1
17	**2012**,		1
16	Photovoltaic device characterization with optical second harmonic generation **2010**,		1

15	Phase evolution in nanocrystalline silicon films: Hydrogen dilution and the cone kinetics model. *Philosophical Magazine*, **2009**, 89, 2461-2468	1.6	1
14	Device physics of heteroepitaxial film c-Si heterojunction solar cells **2012**,		1
13	Pulsed-illumination study of metastable defect creation time scales in hydrogenated amorphous silicon. *Physical Review B*, **2004**, 69,	3.3	1
12	Metastable defects by low-intensity pulsed illumination of hydrogenated amorphous silicon. *Materials Research Society Symposia Proceedings*, **2000**, 609, 321		1
11	Hydrogen Diffusion in the Hydrogen Collision Model of Amorphous Silicon Metastability. *Materials Research Society Symposia Proceedings*, **1999**, 557, 377		1
10	Light Bias CPM Study of the Density of States in N-Type Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **1996**, 420, 703		1
9	Wide GAP a-SiC:H Alloys for Novel Photovoltaic-Electrochromic Window Coatings. *Materials Research Society Symposia Proceedings*, **1995**, 377, 589		1
8	New Results on Enhanced Deuterium Diffusion Under Illumination in Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **1992**, 258, 431		1
7	Amorphous to Microcrystalline Transition in Thickness-graded Hot-Wire CVD Silicon Films. *Materials Research Society Symposia Proceedings*, **2002**, 715, 1711		1
6	Materials Optimization for Silicon Heterojunction Solar Cells Using Spectroscopic Ellipsometry. *Materials Research Society Symposia Proceedings*, **2007**, 989, 4		
5	Increase of temperature and crystallinity during electrical switching in microcrystalline silicon. *Materials Research Society Symposia Proceedings*, **2004**, 808, 185		
4	Photoconductivity Stability Improvement in Hydrogenated Amorphous Silicon by Ultraviolet Illumination. *Materials Research Society Symposia Proceedings*, **2002**, 715, 19111		
3	Combinatorial Studies of Switching and Solid-Phase Crystallization in Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **2005**, 894, 1		
2	Determination of the Mobile-Hydrogen Charge State in Hydrogenated Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **2001**, 664, 2821		
1	Monte Carlo Simulations of Defect Relaxation in Amorphous Silicon. *Materials Research Society Symposia Proceedings*, **1995**, 377, 293		