Zachary C Holman

List of Publications by Citations

86 papers	6,042 citations	32 h-index	77 g-index
103 ext. papers	7,377 ext. citations	11.9 avg, IF	6.02 L-index

#	Paper	IF	Citations
86	23.6%-efficient monolithic perovskite/silicon tandem solar cells with improved stability. *Nature Energy*, **2017**, 2,	62.3	965
85	High-efficiency Silicon Heterojunction Solar Cells: A Review. *Green*, **2012**, 2, 7-24		576
84	Current Losses at the Front of Silicon Heterojunction Solar Cells. *IEEE Journal of Photovoltaics*, **2012**, 2, 7-15	3.7	379
83	Triple-halide wide-band gap perovskites with suppressed phase segregation for efficient tandems. *Science*, **2020**, 367, 1097-1104	33.3	366
82	Hybrid solar cells from P3HT and silicon nanocrystals. *Nano Letters*, **2009**, 9, 449-52	11.5	353
81	Resolving spatial and energetic distributions of trap states in metal halide perovskite solar cells. *Science*, **2020**, 367, 1352-1358	33.3	322
80	Grain Engineering for Perovskite/Silicon Monolithic Tandem Solar Cells with Efficiency of 25.4%. *Joule*, **2019**, 3, 177-190	27.8	227
79	Infrared light management in high-efficiency silicon heterojunction and rear-passivated solar cells. *Journal of Applied Physics*, **2013**, 113, 013107	2.5	221
78	Efficient Semitransparent Perovskite Solar Cells for 23.0%-Efficiency Perovskite/Silicon Four-Terminal Tandem Cells. *Advanced Energy Materials*, **2016**, 6, 1601128	21.8	203
77	>21% Efficient Silicon Heterojunction Solar Cells on n- and p-Type Wafers Compared. *IEEE Journal of Photovoltaics*, **2013**, 3, 83-89	3.7	165
76	Minimizing Current and Voltage Losses to Reach 25% Efficient Monolithic Two-Terminal Perovskite–Silicon Tandem Solar Cells. *ACS Energy Letters*, **2018**, 3, 2173-2180	20.1	143
75	Improving metal reflectors by suppressing surface plasmon polaritons: a priori calculation of the internal reflectance of a solar cell. *Light: Science and Applications*, **2013**, 2, e106-e106	16.7	123
74	Overcoming Redox Reactions at Perovskite-Nickel Oxide Interfaces to Boost Voltages in Perovskite Solar Cells. *Joule*, **2020**, 4, 1759-1775	27.8	121
73	Monocrystalline CdTe solar cells with open-circuit voltage over 1 V and efficiency of 17%. *Nature Energy*, **2016**, 1,	62.3	117
72	Optimization of Si NC/P3HT Hybrid Solar Cells. *Advanced Functional Materials*, **2010**, 20, 2157-2164	15.6	116
71	Germanium and silicon nanocrystal thin-film field-effect transistors from solution. *Nano Letters*, **2010**, 10, 2661-6	11.5	114
70	Controlling Thin-Film Stress and Wrinkling during Perovskite Film Formation. *ACS Energy Letters*, **2018**, 3, 1225-1232	20.1	108

69	Simplified interconnection structure based on C60/SnO2-x for all-perovskite tandem solar cells. *Nature Energy*, **2020**, 5, 657-665	62.3	85
68	Record Infrared Internal Quantum Efficiency in Silicon Heterojunction Solar Cells With Dielectric/Metal Rear Reflectors. *IEEE Journal of Photovoltaics*, **2013**, 3, 1243-1249	3.7	81
67	Nature-inspired chiral metasurfaces for circular polarization detection and full-Stokes polarimetric measurements. *Light: Science and Applications*, **2019**, 8, 78	16.7	75
66	An all-gas-phase approach for the fabrication of silicon nanocrystal light-emitting devices. *Nano Letters*, **2012**, 12, 2822-5	11.5	58
65	Parasitic absorption in the rear reflector of a silicon solar cell: Simulation and measurement of the sub-bandgap reflectance for common dielectric/metal reflectors. *Solar Energy Materials and Solar Cells*, **2014**, 120, 426-430	6.4	57
64	Techno-economic viability of silicon-based tandem photovoltaic modules in the United States. *Nature Energy*, **2018**, 3, 747-753	62.3	56
63	Optical modeling of wide-bandgap perovskite and perovskite/silicon tandem solar cells using complex refractive indices for arbitrary-bandgap perovskite absorbers. *Optics Express*, **2018**, 26, 27441-27460	3.3	56
62	Analysis of lateral transport through the inversion layer in amorphous silicon/crystalline silicon heterojunction solar cells. *Journal of Applied Physics*, **2013**, 114, 074504	2.5	46
61	Nanocrystal inks without ligands: stable colloids of bare germanium nanocrystals. *Nano Letters*, **2011**, 11, 2133-6	11.5	43
60	Amorphous silicon carbide passivating layers for crystalline-silicon-based heterojunction solar cells. *Journal of Applied Physics*, **2015**, 118, 065704	2.5	41
59	. *IEEE Journal of Photovoltaics*, **2015**, 5, 1791-1799	3.7	37
58	15.3%-Efficient GaAsP Solar Cells on GaP/Si Templates. *ACS Energy Letters*, **2017**, 2, 1911-1918	20.1	36
57	Solution-processed germanium nanocrystal thin films as materials for low-cost optical and electronic devices. *Langmuir*, **2009**, 25, 11883-9	4	36
56	Manufacturing 100-μm-thick silicon solar cells with efficiencies greater than 20% in a pilot production line. *Physica Status Solidi (A) Applications and Materials Science*, **2015**, 212, 13-24	1.6	33
55	Series Resistance Measurements of Perovskite Solar Cells Using Jsc–Voc Measurements. *Solar Rrl*, **2019**, 3, 1800378	7.1	30
54	Passivation, conductivity, and selectivity in solar cell contacts: Concepts and simulations based on a unified partial-resistances framework. *Journal of Applied Physics*, **2019**, 126, 183103	2.5	28
53	Silicon heterojunction solar cells with effectively transparent front contacts. *Sustainable Energy and Fuels*, **2017**, 1, 593-598	5.8	25
52	Accuracy of expressions for the fill factor of a solar cell in terms of open-circuit voltage and ideality factor. *Journal of Applied Physics*, **2016**, 120, 123111	2.5	24

51	Aerosol Impaction-Driven Assembly System for the Production of Uniform Nanoparticle Thin Films with Independently Tunable Thickness and Porosity. *ACS Applied Nano Materials*, **2018**, 1, 4351-4357	5.6	22
50	Plasma synthesis of group IV quantum dots for luminescence and photovoltaic applications. *Pure and Applied Chemistry*, **2008**, 80, 1901-1908	2.1	22
49	Contact Resistivity of the p-Type Amorphous Silicon Hole Contact in Silicon Heterojunction Solar Cells. *IEEE Journal of Photovoltaics*, **2020**, 10, 54-62	3.7	21
48	Absolute absorption cross sections of ligand-free colloidal germanium nanocrystals. *Applied Physics Letters*, **2012**, 100, 133108	3.4	20
47	20%-efficient epitaxial GaAsP/Si tandem solar cells. *Solar Energy Materials and Solar Cells*, **2019**, 202, 110144	6.4	19
46	Pre-Fabrication Gettering and Hydrogenation Treatments for Silicon Heterojunction Solar Cells: A Possible Path to >700 mV Open-Circuit Voltages Using Low-Lifetime Commercial-Grade p-Type Czochralski Silicon. *Solar Rrl*, **2018**, 2, 1700221	7.1	19
45	Current-Matched III-V/Si Epitaxial Tandem Solar Cells with 25.0% Efficiency. *Cell Reports Physical Science*, **2020**, 1, 100208	6.1	18
44	Loss Analysis of Monocrystalline CdTe Solar Cells With 20% Active-Area Efficiency. *IEEE Journal of Photovoltaics*, **2017**, 7, 900-905	3.7	16
43	Ultra-wide-bandgap AlGaN homojunction tunnel diodes with negative differential resistance. *Applied Physics Letters*, **2019**, 115, 082104	3.4	16
42	Plasma-initiated rehydrogenation of amorphous silicon to increase the temperature processing window of silicon heterojunction solar cells. *Applied Physics Letters*, **2016**, 109, 031601	3.4	16
41	Photonic Crystal Waveguides for >90% Light Trapping Efficiency in Luminescent Solar Concentrators. *ACS Photonics*, **2020**, 7, 2122-2131	6.3	13
40	Visualizing light trapping within textured silicon solar cells. *Journal of Applied Physics*, **2020**, 127, 063104	2.5	13
39	Hetero-emitter GaP/Si solar cells with high Si bulk lifetime **2016**,		11
38	Complete regeneration of BO-related defects in n-type upgraded metallurgical-grade Czochralski-grown silicon heterojunction solar cells. *Applied Physics Letters*, **2018**, 113, 152105	3.4	11
37	CdCl2 passivation of polycrystalline CdMgTe and CdZnTe absorbers for tandem photovoltaic cells. *Journal of Applied Physics*, **2018**, 123, 203101	2.5	11
36	Sub-micrometer random-pyramid texturing of silicon solar wafers with excellent surface passivation and low reflectance. *Solar Energy Materials and Solar Cells*, **2020**, 218, 110761	6.4	10
35	Defect engineering of p-type silicon heterojunction solar cells fabricated using commercial-grade low-lifetime silicon wafers. *Progress in Photovoltaics: Research and Applications*, **2019**,	6.8	9
34	Origins of hydrogen that passivates bulk defects in silicon heterojunction solar cells. *Applied Physics Letters*, **2019**, 115, 252103	3.4	9

33	Low-refractive-index nanoparticle interlayers to reduce parasitic absorption in metallic rear reflectors of solar cells. *Physica Status Solidi (A) Applications and Materials Science*, **2017**, 214, 1700179	1.6	8
32	. *IEEE Journal of Photovoltaics*, **2020**, 10, 363-371	3.7	8
31	Carrier scattering mechanisms limiting mobility in hydrogen-doped indium oxide. *Journal of Applied Physics*, **2018**, 123, 245102	2.5	8
30	Monocrystalline CdTe/MgCdTe Double-Heterostructure Solar Cells With ZnTe Hole Contacts. *IEEE Journal of Photovoltaics*, **2017**, 7, 307-312	3.7	6
29	. *IEEE Journal of Photovoltaics*, **2018**, 8, 581-586	3.7	6
28	Evaluation of metal oxides prepared by reactive sputtering as carrier-selective contacts for crystalline silicon solar cells **2015**,		6
27	CdTe nBn photodetectors with ZnTe barrier layer grown on InSb substrates. *Applied Physics Letters*, **2016**, 109, 121112	3.4	6
26	Silicon Nitride Barrier Layers Mitigate Minority-Carrier Lifetime Degradation in Silicon Wafers During Simulated MBE Growth of III-V Layers. *IEEE Journal of Photovoltaics*, **2019**, 9, 431-436	3.7	5
25	Silicon wafers with optically specular surfaces formed by chemical polishing. *Journal of Materials Science: Materials in Electronics*, **2016**, 27, 10270-10275	2.1	5
24	Reducing sputter induced stress and damage for efficient perovskite/silicon tandem solar cells. *Journal of Materials Chemistry A*, **2022**, 10, 1343-1349	13	5
23	Investigation of the Selectivity of Carrier Transport Layers in Wide-Bandgap Perovskite Solar Cells. *Solar Rrl*, **2021**, 5, 2100107	7.1	5
22	Substrate-independent analysis of microcrystalline silicon thin films using UV Raman spectroscopy. *Physica Status Solidi (B): Basic Research*, **2017**, 254, 1700204	1.3	4
21	GaAs/silicon PVMirror tandem photovoltaic mini-module with 29.6% efficiency with respect to the outdoor global irradiance. *Progress in Photovoltaics: Research and Applications*, **2019**, 27, 469-475	6.8	4
20	P-type Upgraded Metallurgical-Grade Multicrystalline Silicon Heterojunction Solar Cells with Open-Circuit Voltages over 690 mV. *Physica Status Solidi (A) Applications and Materials Science*, **2019**, 216, 1900319	1.6	4
19	Scanning Laser-Beam-Induced Current Measurements of Lateral Transport Near-Junction Defects in Silicon Heterojunction Solar Cells. *IEEE Journal of Photovoltaics*, **2014**, 4, 154-159	3.7	3
18	PVMirrors: Hybrid PV/CSP collectors that enable lower LCOEs **2017**,		3
17	2018,		3
16	Aerosol impaction-driven assembly produces evenly dispersed nanoparticle coating on polymeric water treatment membranes. *Journal of Nanoparticle Research*, **2020**, 22, 1	2.3	2

15	Inserting a Low-Refractive-Index Dielectric Rear Reflector into PERC Cells: Challenges and Opportunities **2019**,		2
14	Evaluating the Impact of and Solutions to Light-induced Degradation in Silicon Heterojunction Solar Cells **2019**,		2
13	Numerical analysis of bifacial silicon-based tandem devices: Shifts in the optimum top-cell bandgap with varying albedo **2018**,		2
12	Understanding Transport in Heterojunction Contact Stacks by Simulating Silicon Heterojunction TLM Structures **2018**,		2
11	Progress with Defect Engineering in Silicon Heterojunction Solar Cells. *Physica Status Solidi - Rapid Research Letters*, **2021**, 15, 2100170	2.5	2
10	Robust passivation of CdSeTe based solar cells using reactively sputtered magnesium zinc oxide. *Solar Energy Materials and Solar Cells*, **2021**, 233, 111388	6.4	2
9	Power Losses in the Front Transparent Conductive Oxide Layer of Silicon Heterojunction Solar Cells: Design Guide for Single-Junction and Four-Terminal Tandem Applications. *IEEE Journal of Photovoltaics*, **2020**, 10, 326-334	3.7	1
8	Thermal model to quantify the impact of sub-bandgap reflectance on operating temperature of fielded PV modules. *Solar Energy*, **2021**, 220, 246-250	6.8	1
7	Properties of hydrogenated indium oxide prepared by reactive sputtering with hydrogen gas **2016**,		1
6	Aluminum–silicon interdiffusion in silicon heterojunction solar cells with a-Si:H(i)/a-Si:H(n/p)/Al rear contacts. *Journal Physics D: Applied Physics*, **2021**, 54, 134002	3	1
5	P-type Hybrid Heterojunction Solar Cells Naturally Incorporating Gettering and Bulk Hydrogenation **2018**,		1
4	19.5%-Efficient Back-Contact Silicon Heterojunction Solar Cell With Self Aligned Metallization Using Multilayer Aluminum Foils **2018**,		1
3	Impact of Tabula Rasa and Phosphorus Diffusion Gettering on 21% Heterojunction Solar Cells Based on n-Type Czochralski-Grown Upgrade Metallurgical-Grade Silicon **2018**,		1
2	Self-Aligned Selective Area Front Contacts on Poly-Si/SiO$_x$ Passivating Contact c-Si Solar Cells. *IEEE Journal of Photovoltaics*, **2022**, 1-12	3.7	1
1	AC-STEM and HRSEM Investigation of Silica Nanoparticle Film Structure. *Microscopy and Microanalysis*, **2019**, 25, 2008-2009	0.5	