

Urs Aeberhard

List of Publications by Year in descending order

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75
papers

980
citations

430874

18
h-index

477307

29
g-index

75
all docs

75
docs citations

75
times ranked

783
citing authors

#	ARTICLE	IF	CITATIONS
1	Microscopic nonequilibrium theory of quantum well solar cells. <i>Physical Review B</i> , 2008, 77, .	3.2	96
2	Theory and simulation of quantum photovoltaic devices based on the non-equilibrium Greenâ€™s function formalism. <i>Journal of Computational Electronics</i> , 2011, 10, 394-413.	2.5	72
3	Effect of spin-orbit coupling on zero-conductance resonances in asymmetrically coupled one-dimensional rings. <i>Physical Review B</i> , 2005, 72, .	3.2	54
4	Optimized amorphous silicon oxide buffer layers for silicon heterojunction solar cells with microcrystalline silicon oxide contact layers. <i>Journal of Applied Physics</i> , 2013, 113, 134501.	2.5	52
5	Silicon heterojunction solar cell with amorphous silicon oxide buffer and microcrystalline silicon oxide contact layers. <i>Physica Status Solidi - Rapid Research Letters</i> , 2012, 6, 193-195.	2.4	49
6	Fluorescence of colloidal PbSe/PbS QDs in NIR luminescent solar concentrators. <i>Physical Chemistry Chemical Physics</i> , 2012, 14, 16223.	2.8	40
7	Wide Gap Microcrystalline Silicon Oxide Emitter for a-SiO _x :H/c-Si Heterojunction Solar Cells. <i>Japanese Journal of Applied Physics</i> , 2013, 52, 122304.	1.5	38
8	Quantum-kinetic theory of photocurrent generation via direct and phonon-mediated optical transitions. <i>Physical Review B</i> , 2011, 84, .	3.2	36
9	Microscopic Perspective on Photovoltaic Reciprocity in Ultrathin Solar Cells. <i>Physical Review Letters</i> , 2017, 118, 247702.	7.8	34
10	Theory and simulation of photogeneration and transport in Si-SiO _x superlattice absorbers. <i>Nanoscale Research Letters</i> , 2011, 6, 242.	5.7	33
11	Photocarrier extraction in GaAsSb/GaAsN type-II QW superlattice solar cells. <i>Applied Physics Letters</i> , 2018, 112, .	3.3	27
12	Quantum-kinetic theory of steady-state photocurrent generation in thin films: Coherent versus incoherent coupling. <i>Physical Review B</i> , 2014, 89, .	3.2	26
13	Hot-carrier optoelectronic devices based on semiconductor nanowires. <i>Applied Physics Reviews</i> , 2021, 8, .	11.3	24
14	Simulation of nanostructure-based and ultra-thin film solar cell devices beyond the classical picture. <i>Journal of Photonics for Energy</i> , 2014, 4, 042099.	1.3	22
15	Photovoltaics at the mesoscale: insights from quantum-kinetic simulation. <i>Journal Physics D: Applied Physics</i> , 2018, 51, 323002.	2.8	21
16	Defect passivation by hydrogen reincorporation for silicon quantum dots in SiC/SiO _x hetero-superlattice. <i>Journal of Non-Crystalline Solids</i> , 2012, 358, 2145-2149.	3.1	20
17	Effective microscopic theory of quantum dot superlattice solar cells. <i>Optical and Quantum Electronics</i> , 2012, 44, 133-140.	3.3	20
18	Simulation of Ultrathin Solar Cells Beyond the Limits of the Semiclassical Bulk Picture. <i>IEEE Journal of Photovoltaics</i> , 2016, 6, 654-660.	2.5	20

#	ARTICLE	IF	CITATIONS
19	Silicon quantum dot formation in SiC/SiO _x hetero-superlattice. Energy Procedia, 2011, 10, 249-254.	1.8	17
20	Theoretical investigation of direct and phonon-assisted tunneling currents in InAlGaAs/InGaAs bulk and quantum-well interband tunnel junctions for multijunction solar cells. Physical Review B, 2013, 87, .	3.2	17
21	Simulation of Nanostructure-Based High-Efficiency Solar Cells: Challenges, Existing Approaches, and Future Directions. IEEE Journal of Selected Topics in Quantum Electronics, 2013, 19, 1-11.	2.9	17
22	Spectral properties of photogenerated carriers in quantum well solar cells. Solar Energy Materials and Solar Cells, 2010, 94, 1897-1902.	6.2	16
23	Impact of built-in fields and contact configuration on the characteristics of ultra-thin GaAs solar cells. Applied Physics Letters, 2016, 109, 033906.	3.3	15
24	Benzene-like N ₆ rings in a Be ₂ N ₆ monolayer: a stable 2D semiconductor with high carrier mobility. Journal of Materials Chemistry C, 2017, 5, 11515-11521.	5.5	15
25	Impact of Nanostructure Configuration on the Photovoltaic Performance of Quantum-Dot Arrays. Physical Review Applied, 2015, 4, .	3.8	14
26	Photon Green's functions for a consistent theory of absorption and emission in nanostructure-based solar cell devices. Optical and Quantum Electronics, 2014, 46, 791-796.	3.3	12
27	Reconciliation of dipole emission with detailed balance rates for the simulation of luminescence and photon recycling in perovskite solar cells. Optics Express, 2021, 29, 14773.	3.4	11
28	Impact of doped microcrystalline silicon oxide layers on crystalline silicon surface passivation. Canadian Journal of Physics, 2014, 92, 758-762.	1.1	10
29	Nonequilibrium Green's function picture of nonradiative recombination of the Shockley-Read-Hall type. Physical Review B, 2019, 99, .	3.2	10
30	Assessment of Photon Recycling in Perovskite Solar Cells by Fully Coupled Optoelectronic Simulation. Physical Review Applied, 2022, 17, .	3.8	10
31	Microscopic theory and numerical simulation of quantum well solar cells. , 2010, , .		9
32	Diluted nitride type-II superlattices: Overcoming the difficulties of bulk GaAsSbN in solar cells. Solar Energy Materials and Solar Cells, 2020, 210, 110500.	6.2	9
33	Quantum-kinetic Theory of Defect-mediated Recombination in Nanostructure-based Photovoltaic Devices. Materials Research Society Symposia Proceedings, 2013, 1493, 91-96.	0.1	8
34	Coupled 3D master equation and 1D drift-diffusion approach for advanced OLED modeling. Journal of the Society for Information Display, 2020, 28, 440-449.	2.1	8
35	Nonequilibrium Green's function theory of coherent excitonic effects in the photocurrent response of semiconductor nanostructures. Physical Review B, 2012, 86, .	3.2	7
36	Annealing induced defects in SiC, SiO _x single layers, and SiC/SiO _x hetero-superlattices. Physica Status Solidi (A) Applications and Materials Science, 2012, 209, 1960-1964.	1.8	7

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37	Quantum-kinetic perspective on photovoltaic device operation in nanostructure-based solar cells. Journal of Materials Research, 2018, 33, 373-386.	2.6	7
38	Ab initio study on localization and finite size effects in the structural, electronic, and optical properties of hydrogenated amorphous silicon. Computational Materials Science, 2018, 155, 159-168.	3.0	7
39	Global minimum beryllium hydride sheet with novel negative Poisson's ratio: first-principles calculations. RSC Advances, 2018, 8, 19432-19436.	3.6	7
40	The nonequilibrium Greenâ€™s function picture of inelastic processes in nanostructure photovoltaics. Journal of Computational Electronics, 2016, 15, 1219-1232.	2.5	6
41	Multiscale in modelling and validation for solar photovoltaics. EPJ Photovoltaics, 2018, 9, 10.	1.6	6
42	Quantum transport simulation of hot carrier photocurrent generation in quantum well solar cells. Semiconductor Science and Technology, 2019, 34, 094002.	2.0	6
43	Challenges in the NEGF Simulation of Quantumâ€™Well Photovoltaics Posed by Nonâ€™Locality and Localization. Physica Status Solidi (B): Basic Research, 2019, 256, 1800500.	1.5	6
44	Simulation of absorption, photogeneration, and carrier extraction in nanostructure-based and ultra-thin film solar cell devices beyond the classical picture. , 2014, , .		5
45	Improvement of hydrogenated microcrystalline ($\frac{1}{4}\text{c}\tilde{\text{Si}}:\text{H}$) single junction solar cells with upconverter at rear side.. Energy Procedia, 2011, 10, 76-82.	1.8	3
46	Optically active defects in SiC, SiOx single layers and SiC/SiOx hetero-superlattices. Solar Energy Materials and Solar Cells, 2014, 129, 3-6.	6.2	3
47	Highly transparent front electrodes with metal fingers for p-i-n thin-film silicon solar cells. EPJ Photovoltaics, 2015, 6, 60501.	1.6	3
48	Towards a Multi-scale Approach to the Simulation of Silicon Hetero-junction Solar Cells. Journal of Green Engineering (discontinued), 2016, 5, 11-32.	0.7	3
49	Computational characterization of a-Si:H/c-Si interfaces. Journal of Computational Electronics, 2018, 17, 1457-1469.	2.5	3
50	Analysis and optimization of perovskite-silicon tandem solar cells by full opto-electronic simulation. , 2020, , .		3
51	Quantum Transport across Amorphous-Crystalline Interfaces in Tunnel Oxide Passivated Contact Solar Cells: Direct versus Defect-Assisted Tunneling. Chinese Physics Letters, 2021, 38, 036301.	3.3	3
52	Amorphous and Nanocrystalline Semiconductors. Physica Status Solidi (A) Applications and Materials Science, 2016, 213, 1638-1640.	1.8	2
53	Numerical Optimization of Organic and Hybrid Multijunction Solar Cells. , 2019, , .		2
54	Ab Initio Description of Optoelectronic Properties at Defective Interfaces in Solar Cells. Lecture Notes in Computer Science, 2017, , 111-124.	1.3	2

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55	Effective microscopic theory of quantum dot superlattice solar cells. , 2011, , .		1
56	Rigorous simulation of InAlGaAs-InGaAs bulk and quantum well interband tunnel junctions for multi-junction solar cells. , 2013, , .		1
57	Simulation of ultra-thin solar cells beyond the semi-classical bulk picture. , 2016, , .		1
58	Multiscale Modeling of Photovoltaic Devices. International Journal of Photoenergy, 2018, 2018, 1-1.	2.5	1
59	Microscopic approach to reciprocity and photon recycling in ultrathin solar cells. , 2020, , .		1
60	Type-II GaAsSb/GaAsN superlattice solar cells. , 2018, , .		1
61	Developing Efficient Upconverter Silicon Solar Cell Devices. , 2013, , .		1
62	Microscopic Theory of Coupled Quantum Well Structures in Photovoltaics. Materials Research Society Symposia Proceedings, 2008, 1101, 1.	0.1	0
63	Photon Green's functions for a consistent theory of absorption and emission in nanostructure-based solar cell devices. , 2013, , .		0
64	Electronic states of elongated PbSe/PbS Core/shell quantum dots. Journal of Physics: Conference Series, 2014, 526, 012010.	0.4	0
65	Introduction to the OQE special issue on numerical simulation of optoelectronic devices NUSODâ€™13. Optical and Quantum Electronics, 2014, 46, 1187-1187.	3.3	0
66	GaAsN/GaAsSb superlattices as 1 eV layers for efficient multi-junction solar cells. , 2018, , .		0
67	Simulation of Thermal Photocarrier Escape in Quantum Well Solar Cells: Electron-Electron vs. Electron-Phonon Interaction. , 2019, , .		0
68	Computational assessment of photon recycling in ultra-thin GaAs solar cells. , 2021, , .		0
69	Photon recycling in perovskite solar cells assessed by a detailed-balance compatible dipole emission model. , 2021, , .		0
70	Rigorous simulation of photon recycling effects in perovskite solar cells and LEDs. , 2021, , .		0
71	Photovoltaic reciprocity and quasi-Fermi level splitting in nanostructure-based solar cells (Conference Presentation). , 2017, , .		0
72	Rigorous modeling of light absorption in nanostructured materials using a parallel high order finite element time-domain technique. , 2018, , .		0

#	ARTICLE	IF	CITATIONS
73	Computational device optimization and parameter extraction for perovskite-based solar cells. , 2020, ,		0
74	Microscopic Modelling of Quantum Well Solar Cells. , 2007, , 237-240.		0
75	P\: Effects of SelfâAbsorption and Photon Recycling in MetalâHalide Perovskite LEDs Assessed by Full OptoâElectronic Device Simulation. Digest of Technical Papers SID International Symposium, 2022, 53, 1365-1368.	0.3	0