Raquel Caballero

List of Publications by Citations

105 papers	2,726 citations	31 h-index	48 g-index
107 ext. papers	2,999 ext. citations	4.6 avg, IF	4.71 L-index

#	Paper	IF	Citations
105	Interpretation of admittance, capacitance-voltage, and current-voltage signatures in Cu(In,Ga)Se2 thin film solar cells. *Journal of Applied Physics*, **2010**, 107, 034509	2.5	215
104	The influence of Na on low temperature growth of CIGS thin film solar cells on polyimide substrates. *Thin Solid Films*, **2009**, 517, 2187-2190	2.2	106
103	Investigation of Cu(In,Ga)Se2 thin-film formation during the multi-stage co-evaporation process. *Progress in Photovoltaics: Research and Applications*, **2013**, 21, 30-46	6.8	95
102	Non-stoichiometry effect and disorder in Cu2ZnSnS4 thin films obtained by flash evaporation: Raman scattering investigation. *Acta Materialia*, **2014**, 65, 412-417	8.4	83
101	Direct insight into grain boundary reconstruction in polycrystalline Cu(In,Ga)SE2 with atomic resolution. *Physical Review Letters*, **2012**, 108, 075502	7.4	83
100	Characterization of Grain Boundaries in Cu(In,Ga)Se$_{bf 2}$ Films Using Atom-Probe Tomography. *IEEE Journal of Photovoltaics*, **2011**, 1, 207-212	3.7	79
99	Confined and Chemically Flexible Grain Boundaries in Polycrystalline Compound Semiconductors. *Advanced Energy Materials*, **2012**, 2, 992-998	21.8	76
98	Depth profiling of Cu(In,Ga)Se2 thin films grown at low temperatures. *Solar Energy Materials and Solar Cells*, **2009**, 93, 859-863	6.4	76
97	The importance of back contact modification in Cu2ZnSnSe4 solar cells: The role of a thin MoO2 layer. *Nano Energy*, **2016**, 26, 708-721	17.1	62
96	Comprehensive comparison of various techniques for the analysis of elemental distributions in thin films. *Microscopy and Microanalysis*, **2011**, 17, 728-51	0.5	62
95	Influence of Na on Cu(In,Ga)Se2 solar cells grown on polyimide substrates at low temperature: Impact on the Cu(In,Ga)Se2/Mo interface. *Applied Physics Letters*, **2010**, 96, 092104	3.4	61
94	Surface Cu depletion of Cu(In,Ga)Se2 films: An investigation by hard X-ray photoelectron spectroscopy. *Acta Materialia*, **2009**, 57, 3645-3651	8.4	60
93	Cu deficiency in multi-stage co-evaporated Cu(In,Ga)Se2 for solar cells applications: Microstructure and Ga in-depth alloying. *Acta Materialia*, **2010**, 58, 3468-3476	8.4	60
92	Direct evidence for a reduced density of deep level defects at grain boundaries of Cu(In,Ga)Se2 thin films. *Physical Review Letters*, **2010**, 105, 116802	7.4	59
91	High-Efficiency (LixCu1$)2ZnSn(S,Se)4 Kesterite Solar Cells with Lithium Alloying. *Advanced Energy Materials*, **2018**, 8, 1801191	21.8	58
90	CuInSe2 Formation by selenization of sequentially evaporated metallic layers. *Solar Energy Materials and Solar Cells*, **2005**, 86, 1-10	6.4	55
89	CuIn1$GaxSe2-based thin-film solar cells by the selenization of sequentially evaporated metallic layers. *Progress in Photovoltaics: Research and Applications*, **2006**, 14, 145-153	6.8	53

88	Characterization of metastabilities in Cu(In,Ga)Se2 thin-film solar cells by capacitance and current-voltage spectroscopy. *Journal of Applied Physics*, **2011**, 110, 094506	2.5	51
87	High efficiency low temperature grown Cu(In,Ga)Se2 thin film solar cells on flexible substrates using NaF precursor layers. *Progress in Photovoltaics: Research and Applications*, **2011**, 19, 547-551	6.8	50
86	The effect of NaF precursors on low temperature growth of CIGS thin film solar cells on polyimide substrates. *Physica Status Solidi (A) Applications and Materials Science*, **2009**, 206, 1049-1053	1.6	49
85	Impact of the Ga concentration on the microstructure of CuIn1 Gax Se2. *Physica Status Solidi - Rapid Research Letters*, **2008**, 2, 135-137	2.5	48
84	Grain-boundary types in chalcopyrite-type thin films and their correlations with film texture and electrical properties. *Thin Solid Films*, **2009**, 517, 2545-2549	2.2	45
83	Influence of iron on defect concentrations and device performance for Cu(In,Ga)Se2 solar cells on stainless steel substrates. *Progress in Photovoltaics: Research and Applications*, **2012**, 20, 568-574	6.8	44
82	Generation-dependent charge carrier transport in Cu(In,Ga)Se2/CdS/ZnO thin-film solar-cells. *Journal of Applied Physics*, **2013**, 113, 044515	2.5	40
81	Quality and stability of compound indium sulphide as source material for buffer layers in Cu(In,Ga)Se2 solar cells. *Solar Energy Materials and Solar Cells*, **2009**, 93, 148-152	6.4	40
80	Origin of defects in CuIn1GaxSe2 solar cells with varied Ga content. *Thin Solid Films*, **2009**, 517, 2244-2247	2.2	37
79	Wide band-gap tuning Cu2ZnSn1GexS4 single crystals: Optical and vibrational properties. *Solar Energy Materials and Solar Cells*, **2016**, 158, 147-153	6.4	35
78	Disorder and variable-range hopping conductivity in Cu2ZnSnS4 thin films prepared by flash evaporation and post-thermal treatment. *Journal of Alloys and Compounds*, **2014**, 596, 140-144	5.7	34
77	Tandem solar cells with Cu(In,Ga)S2 top cells on ZnO coated substrates. *Solar Energy Materials and Solar Cells*, **2010**, 94, 1880-1883	6.4	34
76	Impact of Na on MoSe2 formation at the CIGSe/Mo interface in thin-film solar cells on polyimide foil at low process temperatures. *Acta Materialia*, **2014**, 63, 54-62	8.4	32
75	Optical and electrical properties of CuIn1GaxSe2 thin films obtained by selenization of sequentially evaporated metallic layers. *Thin Solid Films*, **2003**, 431-432, 200-204	2.2	31
74	Band-gap engineering of Cu 2 ZnSn 1 x Ge x S 4 single crystals and influence of the surface properties. *Acta Materialia*, **2014**, 79, 181-187	8.4	30
73	Cu in In2S3: interdiffusion phenomena analysed by high kinetic energy X-ray photoelectron spectroscopy. *Physica Status Solidi (A) Applications and Materials Science*, **2009**, 206, 1059-1062	1.6	30
72	Analysis of Cu(In,Ga)(S,Se)2 thin-film solar cells by means of electron microscopy. *Solar Energy Materials and Solar Cells*, **2011**, 95, 1452-1462	6.4	30
71	Towards the growth of Cu2ZnSn1GexS4 thin films by a single-stage process: Effect of substrate temperature and composition. *Solar Energy Materials and Solar Cells*, **2015**, 139, 1-9	6.4	27

70	Raman scattering analysis of Cu-poor Cu(In,Ga)Se2 cells fabricated on polyimide substrates: Effect of Na content on microstructure and phase structure. *Thin Solid Films*, **2011**, 519, 7300-7303	2.2	27
69	Comparative studies between Cu?Ga?Se and Cu?In?Se thin film systems. *Thin Solid Films*, **2002**, 403-404, 107-111	2.2	26
68	Na incorporation into Cu(In,Ga)Se2 thin-film solar cell absorbers deposited on polyimide: Impact on the chemical and electronic surface structure. *Journal of Applied Physics*, **2012**, 111, 034903	2.5	25
67	Spectroscopic ellipsometry study of Cu2ZnSnSe4 bulk crystals. *Applied Physics Letters*, **2014**, 105, 061909	3.4	24
66	Multiwavelength excitation Raman scattering of Cu2ZnSn1-xGex(S,Se)4 single crystals for earth abundant photovoltaic applications. *Journal of Alloys and Compounds*, **2017**, 692, 249-256	5.7	24
65	Atom Probe Tomography of Compound Semiconductors for Photovoltaic and Light-Emitting Device Applications. *Microscopy Today*, **2012**, 20, 18-24	0.4	24
64	Cu2ZnSnS4 thin film solar cells grown by fast thermal evaporation and thermal treatment. *Solar Energy*, **2017**, 141, 236-241	6.8	22
63	Real-time study of Ga diffusion processes during the formation of Cu(In,Ga)Se2: The role of Cu and Na content. *Solar Energy Materials and Solar Cells*, **2013**, 116, 102-109	6.4	22
62	Preparation and characterization of CuIn1−xGaxSe2 thin films obtained by sequential evaporations and different selenization processes. *Thin Solid Films*, **2005**, 474, 70-76	2.2	22
61	Control of secondary phases and disorder degree in Cu2ZnSnS4 films by sulfurization at varied subatmospheric pressures. *Solar Energy Materials and Solar Cells*, **2019**, 200, 109915	6.4	21
60	Electron-beam-induced current at absorber back surfaces of Cu(In,Ga)Se2 thin-film solar cells. *Journal of Applied Physics*, **2014**, 115, 014504	2.5	21
59	Surface Cu-depletion of Cu(In,Ga)Se2 thin films: Further experimental evidence for a defect-induced surface reconstruction. *Journal of Applied Physics*, **2010**, 107, 113540	2.5	21
58	Physical routes for the synthesis of kesterite. *JPhys Energy*, **2019**, 1, 042003	4.9	19
57	Effect of Magnesium Incorporation on Solution-Processed Kesterite Solar Cells. *Frontiers in Chemistry*, **2018**, 6, 5	5	19
56	The role of the CdS buffer layer in CuGaSe2-based solar cells. *Journal of Physics Condensed Matter*, **2007**, 19, 356222	1.8	19
55	Characterization of flexible thin film CIGSe solar cells grown on different metallic foil substrates. *Energy Procedia*, **2010**, 2, 109-117	2.3	18
54	SnS thin films grown by sulfurization of evaporated Sn layers: Effect of sulfurization temperature and pressure. *Thin Solid Films*, **2016**, 612, 202-207	2.2	17
53	Effect of Cu excess on three-stage CuGaSe2 thin films using in-situ process controls. *Thin Solid Films* , **2007**, 515, 5862-5866	2.2	17

52	Decoupling of optoelectronic properties from morphological changes in sodium treated kesterite thin film solar cells. *Solar Energy*, **2018**, 175, 94-100	6.8	16
51	Nanoscale investigations of the electronic surface properties of Cu(In,Ga)Se2 thin films by scanning tunneling spectroscopy. *Solar Energy Materials and Solar Cells*, **2011**, 95, 1537-1543	6.4	16
50	Raman mapping of MoS2 at Cu2ZnSnS4/Mo interface in thin film. *Solar Energy*, **2020**, 205, 154-160	6.8	15
49	Preparation and optical characterization of Cu2ZnGeSe4 thin films. *Optical Materials*, **2015**, 40, 76-80	3.3	15
48	Cu2ZnSnS4 thin films grown by flash evaporation and subsequent annealing in Ar atmosphere. *Thin Solid Films*, **2013**, 535, 62-66	2.2	15
47	Sulfurization of co-evaporated Cu2ZnSnSe4 thin film solar cells: The role of Na. *Solar Energy Materials and Solar Cells*, **2018**, 186, 115-123	6.4	14
46	RF Electromagnetic Field Treatment of Tetragonal Kesterite CZTSSe Light Absorbers. *Nanoscale Research Letters*, **2017**, 12, 408	5	14
45	Heat Induced Passivation of CuInSe2 Surfaces: A Strategy to Optimize the Efficiency of Chalcopyrite Thin Film Solar Cells?. *Advanced Materials Interfaces*, **2014**, 1, 1300040	4.6	14
44	Gallium gradients in chalcopyrite thin films: Depth profile analyses of films grown at different temperatures. *Journal of Applied Physics*, **2011**, 110, 093509	2.5	12
43	Determination of the structural and optical characteristics of Cu2ZnSnS4 semiconductor thin films. *Semiconductors*, **2014**, 48, 1296-1302	0.7	11
42	Chemical compositional non-uniformity and its effects on CIGS solar cell performance at the nm-scale. *Solar Energy Materials and Solar Cells*, **2012**, 98, 78-82	6.4	10
41	Examination of growth kinetics of copper rich Cu(In,Ga)Se2-films using synchrotron energy dispersive X-ray diffractometry. *Solar Energy Materials and Solar Cells*, **2011**, 95, 250-253	6.4	10
40	Effect of Na and the back contact on Cu2Zn(Sn,Ge)Se4 thin-film solar cells: Towards semi-transparent solar cells. *Solar Energy*, **2020**, 206, 555-563	6.8	7
39	Influence of Zn excess on compositional, structural and vibrational properties of Cu2ZnSn0.5Ge0.5Se4 thin films and their effect on solar cell efficiency. *Solar Energy*, **2020**, 199, 864-871	6.8	7
38	Thickness-dependent structural parameters of kesterite Cu 2 ZnSnSe 4 thin films for solar cell absorbers. *Materials Letters*, **2018**, 225, 82-84	3.3	7
37	In-depth elemental characterization of Cu(In,Ga)Se2 thin film solar cells by means of RBS and PIXE techniques. *Nuclear Instruments & Methods in Physics Research B*, **2014**, 331, 93-95	1.2	7
36	Enhanced Efficiency of CIGS Thin Film Solar Cells on Polyimide Substrates. *Materials Research Society Symposia Proceedings*, **2009**, 1165, 1		7
35	Structural and morphological properties of Cu(In, Ga)Se2 thin films on Mo substrate. *Applied Surface Science*, **2004**, 238, 180-183	6.7	7

34	Advanced characterization and in-situ growth monitoring of Cu(In,Ga)Se2 thin films and solar cells. *Solar Energy*, **2018**, 170, 102-112	6.8	7
33	Raman characterization and modelling of Cu 2 ZnSn 1-X Ge X S 4 single crystals grown using chemical vapor transport. *Optical Materials*, **2017**, 66, 671-677	3.3	6
32	Spectroscopic ellipsometry study of Cu2ZnSnS4 bulk poly-crystals. *Applied Physics Letters*, **2018**, 112, 161901	3.4	6
31	Application of PLD to the production of plasmonic structures containing Ag nanoparticles based on chalcopyrite solar cells. *Energy Procedia*, **2011**, 10, 38-42	2.3	6
30	Sub-bandgap photoconductivity and photocapacitance in CIGS thin films and devices. *Thin Solid Films*, **2011**, 519, 7489-7492	2.2	6
29	Experimental verification of optically optimized CuGaSe2top cell for improving chalcopyrite tandems. *EPJ Photovoltaics*, **2010**, 1, 10601	0.7	6
28	Comprehensive Comparison of Various Techniques for the Analysis of Elemental Distributions in Thin Films: Additional Techniques. *Microscopy and Microanalysis*, **2015**, 21, 1644-1648	0.5	5
27	Experimental verification of optically optimized CuGaSe2top cell for improving chalcopyrite tandems. *EPJ Photovoltaics*, **2010**, 1, 10601	0.7	5
26	CuGaSe2-Based Solar Cells with High Open Circuit Voltage. *Materials Research Society Symposia Proceedings*, **2007**, 1012, 1		5
25	Routes to develop a [S]/([S]+[Se]) gradient in wide band-gap Cu2ZnGe(S,Se)4 thin-film solar cells. *Journal of Alloys and Compounds*, **2021**, 868, 159253	5.7	5
24	Hard x-ray photoelectron spectroscopy of chalcopyrite solar cell components. *Applied Physics Letters*, **2012**, 100, 092108	3.4	4
23	The role of the spray pyrolysed Al2O3 barrier layer in achieving high efficiency solar cells on flexible steel substrates. *Applied Physics A: Materials Science and Processing*, **2011**, 104, 407-413	2.6	4
22	Influence of Mo Back-Contact Oxidation on Properties of CIGSe$_{2}$ Thin Film Solar Cells on Glass Substrates. *Japanese Journal of Applied Physics*, **2012**, 51, 10NC02	1.4	4
21	CGS-Thin Films Solar Cells on Transparent Back Contact **2006**,		4
20	Application of ICP-OES to the determination of CuIn(1-x)Ga(x)Se2 thin films used as absorber materials in solar cell devices. *Analytical and Bioanalytical Chemistry*, **2005**, 382, 466-70	4.4	4
19	Influence of hydrogen plasma treatment on secondary phases in CZTS thin films for energy harvesting. *Materials Today Communications*, **2021**, 28, 102664	2.5	4
18	Annealing study and thermal investigation on bismuth sulfide thin films prepared by chemical bath deposition in basic medium. *Applied Physics A: Materials Science and Processing*, **2018**, 124, 1	2.6	3
17	Aspects for the optimization of CIGSe growth at low temperatures for application in thin film solar cells on polyimide foil **2009**,		3

16	Incorporation of Na in Low-Temperature Deposition of CIGS Flexible Solar Cells. *Materials Research Society Symposia Proceedings*, **2009**, 1210, 1		3
15	A reliable optical method for in situ process control for deposition of Cu(In,Ga)Se 2 thin layers for photovoltaics **2007**,		3
14	Structural investigations of copper incorporation into In-Ga-Se precursor layers for Cu(In,Ga)Se2 thin films. *Physica Status Solidi C: Current Topics in Solid State Physics*, **2009**, 6, 1249-1252		2
13	Spectroscopic ellipsometry study of Cu2ZnSn(SxSe1-x)4 bulk polycrystals. *Journal of Alloys and Compounds*, **2020**, 843, 156013	5.7	1
12	Deviations from Rutherford elastic scattering cross sections for Cu and Zn with He ions. *Nuclear Instruments & Methods in Physics Research B*, **2014**, 332, 191-194	1.2	1
11	Elemental Distribution Profiling of Thin Films for Solar Cells **2011**, 411-448		1
10	Latest results of the German joint project flexible CIGSe thin film solar cells for space applications **2010**,		1
9	Electron backscatter diffraction: Exploring the microstructure in Cu(In,Ga)(S,Se)2 and CdTe thin-film solar cells **2010**,		1
8	Evaluating different Na-incorporation methods for low temperature grown CIGSe thin film on polyimide foils **2011**,		1
7	New findings of the German joint project flexible CIGSe thin film solar cells for space flight **2009**,		1
6	Alloying and selenization of Cu-In stacked layers evaporated onto large areas. *Materials Research Society Symposia Proceedings*, **2001**, 668, 1		1
5	The effect of annealing temperature on Cu2ZnGeSe4 thin films and solar cells grown on transparent substrates. *JPhys Materials*, **2021**, 4, 034009	4.2	1
4	Wide band gap Cu2ZnGe(S,Se)4 thin films and solar cells: Influence of Na content and incorporation method. *Solar Energy*, **2021**, 226, 251-259	6.8	0
3	Accessing Elemental Distributions in Thin Films for Solar Cells **2016**, 523-567		
2	Reactive sputtering of ZnO/ZnO:Al contacts for chalcopyrite solar modules. *Thin Solid Films*, **2011**, 520, 1295-1298	2.2	
1	Influence of Mo Back-Contact Oxidation on Properties of CIGSe2Thin Film Solar Cells on Glass Substrates. *Japanese Journal of Applied Physics*, **2012**, 51, 10NC02	1.4	