



European
Kesterite
Workshop

Ghent

29-30 November 2018

DAY 1 THURSDAY November 29 th		
8:45	Registration	
9:20	Opening session	Room 2.3 August Vermeylen
9:20	Welcome speech	
Session 1	Fundamental properties	Room 2.3 August Vermeylen
	(Chair: Yaroslav Romanyuk, EMPA)	
9:30	Exploring the growth and properties of $\text{Cu}_2\text{CdGeSe}_4$ absorber material for solar cells	Maarja Grossberg (Tallinn University of Technology)
9:50	$\text{Cu}_2\text{Zn}(\text{Ge}_x\text{Si}_{1-x})\text{Se}_4$ coexistence of two structure types	Sarah Niedenzu (Helmholtz-Zentrum Berlin)
10:10	Relating Carrier Dynamics and Photovoltaic Device Performance of a CZTSe Single Crystal	Jason Baxter (Drexel University)
10:30	Understanding $\text{Cu}_2\text{ZnGeSe}_4$ synthesis: comparative study with pure Sn compound	Nada Benhaddou (University of Rabat)
10:50	Coffee break	
11:20	Session 2	Room 2.3 August Vermeylen
	Defects	
	(Chair: Maarja Grossberg, Tallinn University of Technology)	
11:20	Elucidating the electronic properties of defects that are affecting the performance of CZTSe solar cells	Johan Lauwaert (Ghent University)
11:40	The formation of Sn-related defects in $\text{Cu}_2\text{ZnSnS}_4$ nanoparticles	Sara Engberg (DTU Fotonik)
12:00	A practical framework for defect engineering in kesterites	Jonathan Scragg (Uppsala University)
12:20	Introduction of oxygen in kesterite processing	Sigbjørn Grini (University of Oslo)
12:40	Non-radiative Carrier Recombination by Lone-pair Formation in Kesterite Solar Cells	Sunghyun Kim (Imperial College London)
13:00	Lunch break	
14:20	Session 3	Room 2.3 August Vermeylen
	Devices	
	(Chair: Levent Gütay, Oldenburg University)	
14:20	Influence of the selenium amount during selenization on properties of CZTSe absorbers and solar cells	Teoman Taskesen (Oldenburg University)
14:40	CZTSSe solar cell with over 12% efficiency: Studies of formation mechanism and H_2S effect using Sn/Cu/Zn precursor	Dae-Hwan Kim (DGIST)
15:00	Flexible $\text{Cu}_2\text{ZnSn}(\text{S},\text{Se})_4$ thin-film solar cells on Mo-foil exceeding photo-conversion efficiency of 10% : Nanoscale imaging of optical and electrical properties	William Jo (Ewha Womans University)
15:20	(Electronic) structure of Ge-kesterites: Impact of S/S+Se ratio	Marcus Bär (Helmholtz-Zentrum Berlin)
15:40	Assessment of the photovoltaic properties of CZTS grown on representative Si solar cell structures for monolithic CZTS/Si tandem applications	Filipe Martinho (Technical University of Denmark)

16:10 Poster session		(chair: Filip Strubbe, Ugent)	Room: Kloostergang
P.1	Sodium doping of $\text{Cu}_2\text{ZnSnS}_4$ thin films and effects on solar cells		Claudia Malerba (Enea -Research Center Casaccia)
P.2	Composition-dependent ultrafast carrier dynamics in CZTSe single crystals		Siming Li (Drexel University)
P.3	TiN and ATO back contacts for CZTS solar cells		Sven Englund (Uppsala University)
P.4	Modelling of the low temperature photoluminescence in $\text{Cu}_2\text{ZnSnS}_4$ thin films		Sergiu Levenco (Helmholtz-Zentrum Berlin)
P.5	Comparison of $\text{Cu}_2\text{ZnSnSe}_4$ and $\text{Cu}_2\text{ZnGeSe}_4$ based solar cell technologies using admittance spectroscopy and time resolved photoluminescence		Guy Brammertz (Imec- division imomec)
P.6	Interface analysis of CdS/ $\text{Cu}_2\text{ZnSnS}_4$ interfaces for varying absorber annealing time using hard x-ray photoelectron spectroscopy		Charlotte Platzer-Björkman (Uppsala University)
P.7	Cation Substitution in Kesterite Monograins		Souhaib Oueslati (Tallinn University of Technology)
P.8	Cation disorder in kesterite-structured $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) from Monte Carlo simulations		Suzanne K Wallace (Imperial College London / University of Bath)
P.9	Detection limits of ZnSe and Cu_2SnSe_3 in $\text{Cu}_2\text{ZnSnSe}_4$ by XANES		Galina Gurieva (Helmholtz Zentrum Berlin)
P.10	Demonstration of highly efficient Sb_2Se_3 solar cells via Vapor Transport Deposition		Youngjin Kim (Korea Advanced Institute of Science and Technology)
P.11	Microstructure alternation in heterojunction interface engineering of CZTS solar cell		Jialiang Huang (University of New South Wales)
P.12	Effects of high intensity pulse excitation on luminescence spectra of $\text{Cu}_2\text{ZnSnSe}_4$ films		Mikhail Sulimov (M.N. Mikheev Institute of Metal Physics)
P.13	Influence of ALD-ZnSnO Buffer Layer Process Conditions on the Characteristics of $\text{Cu}_2\text{ZnSn(S,Se)}_4$ Solar Cells		Jae Yu Cho (Chonnam National University)
P.14	CZTS solar cells with a ZnCdS buffer deposited by CBD		Valentini Matteo (ENEA)
P.15	The Formation of Zn(O,S) Buffer Layers by Atomic Layer Deposition for $\text{Cu}_2\text{ZnSn(S,Se)}_4$ Thin Film Solar Cells		Hiji Jeong (Chonnam National University)
P.16	Characterization of the fine-grained, carbon-rich layer in solution based $\text{Cu}_2\text{ZnSn(S,Se)}_4$ solar cells and its impact on device performance		Willi Kogler (Zentrum für Sonnenenergie- und Wasserstoff-Forschung)
P.17	8% flexible CZTSSe solar cell on Mo foils		Eunae Jo (Chonnam National University)
P.18	Improving the performance of $\text{Cu}_2\text{ZnSn(S}_x\text{Se}_{1-x})_4$ (CZTSSe) thin film solar cells by optimizing annealing pressure and CdS buffer layer thickness		Myeng Gil Gang (Chonnam National University)
P.19	Resolving interference effect for inorganic $\text{Cu}_2\text{ZnSn(S, Se)}_4$ solar cell using the facile solution processed graphene oxide layer		Jihun Kim (Gwangju Institute of Science and Technology)
P.20	Electrical characterizations of spin coated CZTS based heterojunctions		Hamide Kavak (Cukurova University)
P.21	Improving bulk properties of CZTS by Mg incorporation by spray pyrolysis		Stener Lie (Nanyang Technological University)
P.22	Silicon Oxynitride Back Contact Barriers for CZTSe Based Thin Film Solar Cells		Wenjian Chen (Carl von Ossietzky University of Oldenburg)
P.23	Reaction Mechanism of CZTSSe Solar Cells with 13% Efficiency		Jin-Kyu Kang (DGIST)
P.24	Optoelectrical properties of enhanced $\text{Cu}_2\text{ZnSn(S,Se)}_4$ thin-film solar cells probed by scanning probe microscopy and confocal micro-Raman mapping		Juran Kim (Ewha Womans University)
P.25	Band alignment of CZTS and Ag alloyed CZTS with CdS		Mungunshagai Gansukh (Technical University of Denmark)
P.26	Comparative study of multi-component oxide and sulfide films for $\text{Cu}_2\text{ZnSnS}_4$ solar cells by PLD		Mungunshagai Gansukh (Technical University of Denmark)
P.27	Open circuit voltage around a white board; Why does it remain low? What to do?		Léo Choubrac (Helmholtz-Zentrum Berlin)
18:40	End of poster session		
19:00	Dinner	Monasterium Poortackere, Oude Houtlei 56, Ghent	

DAY 2	FRIDAY	November 30 th	
8:50	Session 4	Interface and device structure (Chair: Samira Khelifi, Ugent)	Room 2.3 August Vermeylen
8:50	<i>invited-talk:</i>	Cd-free Zn(S,O,OH) buffer layer for CZTSSe monograin photovoltaic devices	Dieter Meissner (Tallinn University of Technology)
9:10		Alkali migration from doped-CdS buffer layer as a novel strategy for controlled doping of kesterite solar cells	Yudania Sánchez Gonzalez (Catalonia Institute for Energy Research)
9:30		Investigation of Ti-based barrier layers for application in monolithic Silicon-Chalcogenide tandem solar cells	Alireza Hajjifarassar (Technical University Denmark)
9:50		On voltage losses evaluation of CZTSSe solar cells with Sn content variation	Antonio Cabas-Vidani (Empa)
10:10		Alkali Doping of Cu ₂ ZnSnS ₄ onto transparent substrates	Alejandro Hernández-Martínez (IREC)
10:30		Coffee break	
11:00	Working group 1:	Progress in understanding of fundamental properties of the absorber (Moderators: Guy Brammertz, imec & Léo Choubrac, HZB)	Room 2.3 August Vermeylen
11:00		Compositional variations in kesterite absorber layers: A comparative SEM-EDX and nanoXRF study	Claudia S. Schnohr (Universität Jena)
11:15		Improved reaction pathway for efficient CZTSe solar cells from metal alloys via a Cu-rich selenization stage	Devendra Pareek (University of Oldenburg)
11:30		High Band Gap Kesterite Absorber Material Using Thermal Annealing of Metallic Precursors	Thierry Kohl (University of Hasselt/ imec)
11:45		Discussion	
12:15		Summary	
	Working group 2:	Progress in cell architecture (Moderators: Edgardo Saucedo, IREC & Jérôme Michallon, IMRA)	Room 1.1 Priorzaal
11:00		Is it possible to obtain a complex S-Se graded bandgap on CZTSSe absorbers?	Jacob Antonio Andrade-Arvizu (IREC)
11:15		Band gap graded kesterite solar cells via an H ₂ S assisted kinetic sulfurization of CZTSe	Levent Gütay (Oldenburg University)
11:30		The photoluminescence efficiency of kesterite derived materials	José Marquez (Helmholtz-Zentrum Berlin)
11:45		Discussion	
12:15		Summary	
12:30		Lunch break	
13:30	Closing session		Room 2.3 August Vermeylen
13:30		Overview of sessions 1-4 and postsession, by Johan Lauwaert, Ugent	
13:40		Overview of working group 1, by Guy Brammertz, imec & Léo Choubrac, HZB	
13:50		Overview of working group 2, by Edgardo Saucedo, IREC & Jérôme Michallon, IMRA	
14:00		Next workshop host election, by ALL	
14:10		End of the Workshop	

Organizing Committee

Johan Lauwaert, *Ghent University*
Filip Strubbe, *Ghent University*
Samira Khelifi, *Ghent University*
Bart Vermang, *University of Hasselt*
Guy Brammertz, *Imec*
Edgardo Saucedo, *Irec*

Scientific Committee

Guy Brammertz, *imec*
Ian Forbes, *Northumbria University*
Maarja Grossberg, *Talinn University*
Joke Hadermann, *University of Antwerp*
Samira Khelifi, *Ghent University*
Johan Lauwaert, *Ghent University*
Yaroslav Romanyuk, *Empa – Swiss Federal Laboratories for Science and Technology*
Egardo Saucedo, *IREC – Catalonia Institute for Energy Research*
Bart Vermang, *University of Hasselt*

PhD pre-meeting workshop organizers

Jacob Andrade, *IREC – Catalonia Institute for Energy Research*
Ingrid Amer Cid, *Ghent University*
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Sheng Yang, *Ghent University*



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