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10th European Kesterite+ Workshop & PhD Day

Uppsala University 20-22 November 2019

Scientific Programme

21 November *Kesterite+ Workshop day 1, Blåsenhus campus. Room: Gunnar Johansson Salen*

8.30	On-site registration opens	Main entrance
9.00	Welcome from Prof. Marika Edoff	Gunnar Johansson Salen
Session 1: *High efficiency Kesterites*		Chair: Jonathan Scragg , Uppsala
9.10	Highlight: >10% efficiency of Cd-free pure sulphide CZTS solar cells	Xiaojing Hao (USNW)
9.35	Status of Crystalsol's development of kesterite module production	Dieter Meissner (Crystalsol)
9.55	Understanding $Cu_2ZnSn(S,Se)_4$ Surface Treatments and Alternative (Zn,Sn)O and Zn(O,S) Buffer Layers for High-Efficiency Thin-Film Kesterite-Based Solar Cells	Dirk Hauschild (KIT)
10.15	Influence of Precursor and Absorber Composition on the Opto-Electronic Properties of High Efficiency CZTSe Solar Cells	David Nowak (University of Oldenburg)
10.35	Coffee break until 11.10	
Session 2: *Beyond Kesterites*		Chair: Edgardo Saucedo, IREC
11.10	Highlight: Beyond Kesterites: which system should I work on?	Aron Walsh (Imperial College London)
11.35	$BaZrS_3$ chalcogenide perovskite thin films	Corrado Comparotto (Uppsala University)
11.55	Shining light on sulfide perovskites: $LaYS_3$ material properties and solar cells	Peter Christian Kjærgaard Vesborg (DTU)
12.15	Development of antimony sulphide thin film semi-transparent solar cells	Oja Acik (TalTech)
12.35	Lunch break until 13.45	
Session 3: *Alkalis and doping in kesterite absorbers*		Chair: Jérôme Michallon, IMRA
13.45	Highlight: Sn/Na/Annealing/Etching: A combinatorial approach to investigate on different parameters of Cu-Zn-Sn-Se absorbers preparation	Leo Choubrac (HZB)
14.10	Study of the effect of alkali doping on the performance of emerging wide band gap absorber $Cu_2ZnGeSe_4$-based thin film solar cells	Sergio Giraldo (IREC)
14.30	On the impact of Na and Sb-doping on the optoelectronic properties of Cu_2ZnSnS_4	David Fermin (University of Bristol)
14.50	Enhanced photo-conversion process of $Cu_2ZnSn(S,Se)_4$ flexible solar cells by optimization of NaF-layer insertion	Juran Kim (Ewha Womans University)
15.10	Coffee break until 15.40	
Session 4: *Crystal and electronic structure of kesterite derivatives and alternatives*		Chair Yaroslav Romanyuk, EMPA
15.40	Deep traps in antimony selenide	Samantha Hood (Imperial College London)
16.00	The kesterite – stannite structural phase transition: comparison of the series $Cu_2(Zn,Fe)S_4$, $Cu_2(Zn,Cd)S_4$ and $Cu_2(Zn,Mn)SnSe_4$	Susan Schorr, HZB
16.20	Anion position and band gap energy of $Cu_2Zn(Sn,Ge)Se_4$ alloys	Konrad Ritter, University of Leipzing
16.40	**Poster session – ends at 18.30 (see next page for poster list)**	
19.00	Workshop dinner	

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Poster session

Board	Title	Presenting author (affiliation)
P1	Stable, carbon-free inks of Cu_2ZnSnS_4 nanoparticles synthesized at room temperature designed for roll-to-roll fabrication of solar cell absorber layers.	Christian Rein (DTU)
P2	Kesterite solar-cells by drop-casting of inorganic sol-gel inks	Giorgio Tseberlidis (University of Milano-Bicocca)
P3	Effect of the H_2 annealing on optoelectrical properties of CZTS thin layers	Zhukova Maria (UC Louvain)
P4	History and prospects of the physical synthesis of kesterite for photovoltaic applications	Thomas Ratz (University of Liege)
P5	FTO as transparent back contact for CZTS solar cells	Sven Englund (Uppsala University)
P6	HAXPES study of the effect of surface treatment on CZTS based thin film solar cells	Natalia Martin (Uppsala University)
P7	Partial cation-substitution in the sulphide kesterite: Absorber and heterojunction engineering	Charif Tamin (CNRS)
P8	Electrostatic modelling of sol-gel spin-coated CZTS/CdS/ZnO diode	Teoman Özdal (Cukurova University)
P9	Numerical modelling of the limiting factors of the efficiency in wide bandgap CZGSe solar cells	Sheng Yang (Ghent University)
P10	Strong interplay between Na and O in Cu-based chalcogenides	Kostiantyn Sopiha (Uppsala University)
P11	Theoretical Efficiency Limit of Kesterite Solar Cells	Sunghyun Kim (Imperial College London)
P12	Analysis of polycrystalline Ag-alloyed Cu_2ZnSnS_4 by 3DXRD	Mariana Mar Lucas (DTU)
P13	Attempting to obtain Te-alloyed CZTSSe	Antonio Cabas Vidani (EMPA)
P14	The effect of S/Se ratio on the properties of $Cu_2CdGe(SxSe_{1-x})_4$ monograin powders for photovoltaic applications	Xiaofeng Li (talTech)
P15	$Cu_2ZnGe(S_{1-x}Se_x)_4$ solid solution – a new synthesis method of bulk material	Sara Niedenzu (HZB)
P16	Random structure search: Solving the kesterite-stannite puzzle in $(Cu,Ag)_2ZnSnSe_4$ solid solution	Daniel Fritsch (HZB)
P17	Photoluminescence of $Cu_2BaSn(S,Se)_4$ thin films	Sergiu Levcenco (HZB)
P18	Synthesis of large area 2D-MoS_2 layers and characterization of structural and opto-electronic properties	Devendra Pareek (University of Oldenburg)
P19	Scanning Probic Investigation of Phases, Current Paths, and Potential Distribution in a Variety of Binary Chalcogenides: Sb_2Se_3, SnS, and FeS_2 for Multiple Energy Applications	Juran Kim (Ewha Womans University)
P20	Strategies Towards Development of Cost-Efficiency Antimony Selenide based solar cells by close-spaced technique	Nicolae Spalatu (TalTech)
P21	Ultrasonic spray pyrolysis growth of Sb_2S_3 thin films for solar cell applications	Jako Siim Eensalu (TalTech)
P22	Post-deposition processing for tuning the properties of Sb_2Se_3 thin film absorber layer grown by close-spaced sublimation technique	Robert Krautmann (TalTech)
P23	Nanostructure control of antimony selenide thin films using physical vapor deposition and its application for photovoltaics	Shi-Joon Sung (DGIST)
P24	On the Se distribution at atomic level in Sb_2Se_3 Q-1D PV absorbers	Pedro Vidal-Fuentes (IREC)
P26	Order-disorder transition in Cu_2ZnSnS_4: how to observe and quantify it using Seebeck coefficient measurements	Eleonora Isotta (University of Trento)
P27	Sn loss induced unit cell modifications in Kesterite thin film solar cells	Klaus Leifer (Uppsala University)

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22 November *Kesterite+ Workshop day 2, Blåsenhus campus, Uppsala*

Session 5: *Wide gap kesterites and tandem cells*		Chair: Bart Vermang, IMEC
9.00	Highlight: Oxide-converted Cu2-II-Sn-S4 absorbers (II = Sr, Ba): exploring a TaS2 back contact and a tandem device structure	Andrea Crovetto (HZB/DTU)
9.25	Back contact optimized Cu2ZnGeS4 solar cell	Nishant Saini (UU)
9.45	Monolithic CuZnSnS4-on-Silicon Tandem solar cells enabled by a diffusion barrier	Alireza Hajijafarassar (DTU)
10.05	Optical optimization of monolithic CZTS/Si tandem cells	Claudia Malerba (ENEA)
10.25	Coffee break until 11.00	
Session 6: Parallel working groups I-III		
	Working group I: Absorber growth and characterisation Moderators: Levent Gütay and Dieter Meissner	Room: Gunnar Johansson Salen
11.00	New approach for an improved formation pathway of Cu2SnZnSe4: Zn incorporation in the Cu2SnSe3-Cu2SnZnSe4 system	Ignacio Becerril-Romero (IREC)
11.20	Study of Cu partial substitution effects on kesterite monograins, device performance and stability	Souhaib Queslati (TalTech)
11.40	Resonant X-ray Ptychographic Nano-Tomography of Kesterite Solar Cells	Jens Wenzel Andreasen (DTU)
12.00	*Time for discussion until 12.40*	
	Working group II: Optoelectronic properties and defects ; Moderators: Maarja Grossberg and David Fermin	Room: 11:128, Blåsenhus
11.00	Band to band photoluminescence emission revealed in post annealed Cu2ZnSnS4 solar cells	Mungunshagai Gansukh (DTU)
11.20	Intrinsic point defects in kesterite-type Cu2ZnGeSe4 compound semiconductors	Daniel Fritsch (HZB)
11.40	Cu/Zn disorder vs. solar cell efficiency: the Cu2ZnSn(SxSe1-x)4 monograin case	Galina Gurieva (HZB)
12.00	*Time for discussion until 12.40*	
	Working group III: Interfaces in kesterite devices Moderators Charlotte Platzer-Björkman and Marcus Bär	Room: 11:129, Blåsenhus
11.00	Characterization of defects presence at the interfaces on 9.4% efficiency CZTSe device	Robert Fonoll-Rubio (IREC)
11.20	Interface states predominated open-circuit-voltage limitation of current state-of-the-art Cu2ZnSnS4 thin-film solar cells	Jianjun Li (USNW)
11.40	Impact of wet-chemical treatments on the chemical and electronic structure of Cu2ZnGeSe4	Marcus Bär (HZB)
12.00	*Time for discussion until 12.40*	
12.40	Lunch break until 14.00	
	Closing session	
14.00	Reflections from organisers and working groups	
14.30	Election of next workshop host	
14.45	Workshop closes	