



European Materials Research Society

# Spring Meeting 2022

May 30 | June 3  
Virtual Conference

## SYMPOSIUM K

### Thin film chalcogenide photovoltaic materials

Symposium Organizers :

Alex REDINGER, University of Luxembourg

Byungha SHIN, Korea Advanced Institute of Science and Technology (KAIST)

Matthew REESE, NREL

Dana COJOCARU-MIRE DIN, RWTH Aachen

Romain CARRON, Empa

Selected papers will be published in a topical issue of Thin Solid Films.



Monday may 30		11:15	<b>Impact of the RbF post-deposition treatment on the interface between Cu(In,Ga)Se<sub>2</sub> and sputter-deposited Ga<sub>2</sub>O<sub>3</sub></b>	K 2.2
09:00	<b>Welcome and Introduction to the Symposium</b>		E. Pyatenko (1,2), D. Hauschild (2,3,4), R. Steininger (2), D. Hariskos (5), W. Witte (5), M. Powalla (5), C. Heske (2,3,4), and L. Weinhardt (2,3,4) (1) Laboratory for Applications of Synchrotron Radiation (LAS), Karlsruhe Institute of Technology (KIT), Kaiserstraße 12, 76131 Karlsruhe, Germany (2) Institute for Photon Science and Synchrotron Radiation (IPS), Karlsruhe Institute of Technology (KIT), Hermann-v.-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany (3) Institute for Chemical Technology and Polymer Chemistry (ITCP), Karlsruhe Institute of Technology (KIT), Engesserstraße 18/20, 76128 Karlsruhe, Germany (4) Department of Chemistry and Biochemistry, University of Nevada, Las Vegas (UNLV), 4505 Maryland Parkway, Las Vegas, NV 89154-4003, United States (5) Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Meitnerstraße 1, 70563 Stuttgart, Germany	
	<b>CIGS: Materials &amp; devices I : Dalibor Thomas - Redinger Alex</b>			
09:10	<b>INV Interface Modification in Chalcopyrite-Based Thin-film Photovoltaic Devices</b>	K 1.1		
	Shogo Ishizuka National Institute of Advanced Industrial Science and Technology (AIST)			
09:40	<b>Wide-gap (Ag,Cu)(In,Ga)Se<sub>2</sub> solar cells - Performance leap by an RbF-PDT?</b>	K 1.2		
	Jan Keller*, Lars Stolt, Olivier Donzel-Gargand and Marika Edoff Ångström Solar Center, Division of Solar Cell Technology, Uppsala University, 75121 Uppsala, Sweden			
09:55	<b>(Ag,Cu)(In,Ga)Se<sub>2</sub> thin film solar cells with more than 23% bifacial efficiencies under 30% albedo condition</b>	K 1.3		
	Shih-Chi Yang, Tzu-Ying Lin, Mario Ochoa, Huagui Lai, Ayodhya N. Tiwari, and Romain Carron (1) Laboratory for Thin Films and Photovoltaics, Empa-Swiss Federal Laboratories for Materials Science and Technology, Ueberlandstr. 129, 8600 Dübendorf, Switzerland: Shih-Chi Yang, Mario Ochoa, Huagui Lai, Ayodhya N. Tiwari, and Romain Carron (2) Department of Material Science, National Tsing Hua University No. 101, Sec. 2, Kuang-Fu Road, Hsinchu 300, Taiwan: Tzu-Ying Lin			
10:10	<b>Silver alloying of wide-gap sulfide CIGS prepared by metal coevaporation and sulfur annealing for tandem solar cell application</b>	K 1.4		
	Alexandre Crossay (1), Jackson Lontchi (2), Amelle Rebai (1), Hugo Gloaguen (3), Eugène Bertin (4,5), Olivier Durand (4), Nicolas Barreau (5), Jean-François Guillemoles (1), Negar Naghavi (1), Daniel Lincot (1,2). (1) CNRS UMR 9006 IPVF, 18 bd Thomas Gobert, 91120 Palaiseau, (2) Institut Photovoltaïque d'Île-de-France, 18 bd Thomas Gobert, 91120 Palaiseau, (3) Université de Nantes, 44000 Nantes, (4) Université de Rennes, INSA Rennes, CNRS, Institut FOTON - UMR 6082, F-35000 Rennes, France, (5) Université de Nantes, CNRS, Institut des Matériaux Jean Rouxel IMN, UMR 6502, F-44322 Nantes 3, France			
10:25	<b>Role of Na and Ag in interconnection between chemical composition and electrical properties of grain boundaries in Cu(In, Ga)Se<sub>2</sub></b>	K 1.5		
	Azam Karami(1), Oana Cojocaru-Mirédin*(1), Marcin Morawski(2), Semih Agca(2), Roland Scheer(2) & Heiko Kempa(2). (1)RWTH Aachen University, Germany, (2)Institution Martin-Luther-Universität Halle-Wittenberg, Germany			
10:40	<b>Discussion</b>			
10:50	<b>CIGS: materials &amp; devices II : Ishizuka Shogo - Carron Romain</b>			
11:00	<b>The Challenges and Developments in Light Management for CIGS Solar Cells</b>	K 2.1		
	A. J. N. Oliveira, J. P. Teixeira, T. S. Lopes, R. F. Alexandre, D. Ramos, J. R. S. Barbosa, K. Oliveira, P. A. Fernandes, P. M. P. Salomé A. J. N. Oliveira, J. P. Teixeira, T.S. Lopes, R. F. Alexandre, D. Ramos, J. R. S. Barbosa, K. Oliveira, P. A. Fernandes, P. M. P. Salomé INL – International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga, 4715-330 Braga, Portugal A. J. N. Oliveira, P. A. Fernandes i3N, Departamento de Física da Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal A. J. N. Oliveira, P. M. P. Salomé Departamento de Física, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal T. S. Lopes Imec division IMOMEC (partner in Solliance), Wetenschapspark 1, 3590 Diepenbeek, Belgium T. S. Lopes Institute for Material Research (IMO), Hasselt University (partner in Solliance), Agaangebouw H, Diepenbeek, 3590, Belgium T. S. Lopes EnergyVille 2, Thor Park 8320, 3600 Genk, Belgium R. F. Alexandre, D. Ramos Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Campus de Caparica, 2829-516 Caparica, Portugal P. A. Fernandes, P. M. P. Salomé CIETI, Departamento de Física, Instituto Superior de Engenharia do Porto, Instituto Politécnico do Porto, Porto 4200-072, Portugal			
			<b>A Facile Pathway for Colloidal Nanoparticle Synthesis and Thin-Film Devices Thereof for Reduction in Carbon Impurities</b>	K 2.3
			Hayes, D. C.* (1), Agrawal, R. (1) (1) Davidson School of Chemical Engineering, Purdue University, West Lafayette, IN 47906, USA	
			<b>Interplay between potassium and copper on epitaxial Cu(In,Ga)Se<sub>2</sub> after post-deposition treatment</b>	K 2.4
			Evandro Martin Lanzoni, Omar Ramirez, Susanne Siebentritt, Alex Redinger Department of Physics and Materials Science, University of Luxembourg, Luxembourg	
			<b>Impact of compositional changes on the quality of the Cu(In,Ga)Se<sub>2</sub> absorber in thin-film solar cells</b>	K 2.5
			Sinju Thomas <sup>1</sup> , Wolfram Witte <sup>2</sup> , Dimitrios Hariskos <sup>2</sup> , Stefan Paetel <sup>2</sup> , Chang-Yun Song <sup>3</sup> , Heiko Kempa <sup>3</sup> , Nora El-Ganainy <sup>4</sup> , Daniel Abou-Ras <sup>1</sup> 1. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany 2. Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Meitnerstr. 1, 70563 Stuttgart, Germany 3. Martin-Luther-Universität Halle-Wittenberg, Institut für Physik, Fachgruppe Photovoltaik, von-Danckelmann-Platz 3, 06120 Halle (Saale) 4. Competence Centre Photovoltaics Berlin (PVcomB) / Helmholtz Zentrum Berlin für Materialien und Energie (HZB), Schwarzschildstr. 3, 12489 Berlin, Germany	
			<b>Discussion</b>	
			<b>Tandems &amp; wide bandgap CIGSe : Sadewasser Sascha - tbd</b>	
14:00	<b>INV Design and Optimization of Perovskite / CIGS Tandem Solar Cells</b>	K 3.1		
	Philip Schulz CNRS, Institut Photovoltaïque d'Île de France (IPVF), UMR 9006, 18 boulevard Thomas Gobert, 91120 Palaiseau, France			
14:30	<b>The Effect of Absorber Stoichiometry on the Stability of Wide-Gap (Ag,Cu)(In,Ga)Se<sub>2</sub> Solar Cells</b>	K 3.2		
	Patrick Pearson, Jan Keller, Charlotte Platzer-Björkman. Uppsala Universitet, Sweden			
14:45	<b>Chemical and electronic structure profiles of wide-gap (Ag,Cu)(In,Ga)Se<sub>2</sub> thin film solar cell absorbers</b>	K 3.3		
	Donald Valenta (1), Jakob Bombsch (1), Regan G. Wilks (1,3), Natalia Martin (2), Tobias Törndahl (2), Charlotte Platzer Björkman (2), Marika Edoff (2), and Marcus Bär (1,3,4,5) (1) Interface Design, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany, (2) Division of Solar Cell Technology, Department of Materials Science and Engineering, Uppsala University, Uppsala, Sweden, (3) Energy Materials In-Situ Laboratory Berlin (EMIL), Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany, (4) Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy, Berlin, Germany (5) Department of Chemistry and Pharmacy, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany			
15:00	<b>Impact of Ag on the electronic transport in low bandgap CuInSe<sub>2</sub> solar cells</b>	K 3.4		
	Maximilian Krause, Simon Moser, Shih-Chi Yang, Shiro Nishiwaki, Ayodhya N. Tiwari, Romain Carron Laboratory for Thin Films and Photovoltaics, Empa - Swiss Federal Laboratories for Materials Science and Technology, Ueberlandstrasse 129, 8600 Dübendorf, Switzerland			

15:15	<b>Theoretical and experimental study of stable and metastable phases in sputtered CuInS<sub>2</sub> absorbers</b> Kostiantyn V. Sopiha <sup>1</sup> , Jes K. Larsen <sup>1</sup> , Clas Persson <sup>2,3</sup> , Charlotte Platzer-Björkman <sup>1</sup> , Marika Edoff <sup>1</sup> <sup>1</sup> . Division of Solar Cell Technology, Department of Materials Science and Engineering, Uppsala University, Box 534, SE-75121 Uppsala, Sweden, <sup>2</sup> . Centre for Materials Science and Nanotechnology/Department of Physics, University of Oslo, P.O. Box 1048, Blindern, NO-0316 Oslo, Norway, <sup>3</sup> . Division of Applied Materials Physics, Department of Materials Science and Engineering, KTH Royal Institute of Technology, SE-10044 Stockholm, Sweden	K 3.5			
				<b>Tuesday may 31</b>	
				<b>Simulations : Pedro Salomé - tbd</b>	
			09:00	<b>INV An accurate and automated approach to generate machine learning interatomic potentials for photovoltaic materials</b> Hossein Mirhosseini Multiscale Modeling of Energy Materials, Dynamics of Condensed Matter, Chair of Theoretical Chemistry, University of Paderborn, Germany	K 5.1
15:30	<b>CuGaSe<sub>2</sub> absorber on FTO transparent back contacts</b> A. Thomere <sup>(1)</sup> , M. Placidi <sup>(1,2)</sup> , Maxim Guc <sup>(1)</sup> , Yudania Sánchez <sup>(1)</sup> , Robert Fonoll-Rubio <sup>(1)</sup> , Victor Izquierdo-Roca <sup>(1)</sup> , Z. Jehl Li-Kao <sup>(2)</sup> , A. Perez-Rodriguez <sup>(1)</sup> <sup>1</sup> . Catalonia Institute for Energy Research-IREC, Jardins de les Dones de Negre, 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain <sup>2</sup> . Polytechnic University of Catalonia, Electrical Engineering Department, c/Jordi Girona 31, Barcelona 08034, Spain	K 3.6	09:30	<b>INV Numerical Simulation of Grain-Boundary in Cu-poor and Cu-rich CIGS thin film solar cells</b> Giovanna Sozzi Department of Engineering and Architecture - University of Parma	K 5.2
15:45	<b>Discussion</b>		10:00	<b>Influence of Interface States on Ultrathin Cu(In,Ga)Se<sub>2</sub> Solar Cells with Mo Back Contact: Simulation Perspective</b> Setareh Sedaghat, Jan Lucaßen, Martina Schmid Faculty of Physics, University of Duisburg-Essen & CENIDE, Forsthausweg 2, 47057, Duisburg, Germany	K 5.3
16:00			10:15	<b>Thermodynamics and kinetics of phase separation in (Ag,Cu)(In,Ga)Se<sub>2</sub></b> Markus Mock, Karsten Albe TU Darmstadt, TU Darmstadt	K 5.4
	<b>Modeling : Mirhosseini - tbd</b>		10:30	<b>Discussion</b>	
16:15	<b>INV Machine Learning for Accelerated Analyses of Time-resolved Photoluminescence Data via Bayesian Inference</b> Calvin Fai, Prof. Tony Ladd, Prof. Charles J. Hages* Department of Chemical Engineering, University of Florida, Gainesville, FL, USA 32611 *presenting author, email: c.hages@ufl.edu	K 4.1	10:45		
				<b>Industrialisation : Philip Schulz - Jan Keller</b>	
16:45	<b>First-principles modelling of hydrogen at the absorber-buffer interface in CuInSe<sub>2</sub>-based solar cells</b> A. G. Marinopoulos CFisUC, Department of Physics, University of Coimbra, P-3004-516 Coimbra, Portugal	K 4.2	11:00	<b>INV CIGSSe Module Efficiencies on the verge of 20%</b> Thomas Dalibor AVANCIS GmbH, Otto-Hahn-Ring 6, D-81739 Munich, Germany	K 6.1
17:00	<b>Digital Twins – a simulation model for Cu(In,Ga)Se<sub>2</sub> solar cells of high and moderate efficiency</b> Matthias Maiberg <sup>1*</sup> , Chang-Yun Song <sup>1</sup> , Marcin Morawski <sup>1</sup> , Felix Neduck <sup>1</sup> , Joshua Damm <sup>1</sup> , Heiko Kempa <sup>1</sup> , Dimitrios Hariskos <sup>2</sup> , Wolfram Witte <sup>2</sup> , Roland Scheer <sup>1</sup> <sup>1</sup> Institute of Physics, Martin-Luther-University Halle-Wittenberg, von-Danckelmann-Platz 4, 06120 Halle (Saale), Germany <sup>2</sup> Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Meitnerstraße 1, 70563 Stuttgart, Germany	K 4.3	11:30	<b>Defects in commercial Cu(In,Ga)Se<sub>2</sub> modules</b> A. Kingma, J. van den Berg, S. Villa, R. Aninat, M. Theelen TNO part of Solliance	K 6.2
17:15	<b>Advanced feature extraction with machine learning and combinatorial spectroscopic analysis for thin-film chalcogenide photovolta</b> Enric Grau-Luque, Maxim Guc, Fabien Atlan, Andreas Zimmermann, Sergio Giraldo, Ignacio Becerril-Romero, Alejandro Perez-Rodriguez, Victor Izquierdo-Roca Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain, Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain, Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain, Sunplugged GmbH, Affenhausen 1, 6413 Wildermieming, Austria, Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain, Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain, Departament d'Enginyeria Electrònica i Biomèdica, IN2UB, Universitat de Barcelona, C/ Martí i Franqués 1, 08028 Barcelona, Spain, Catalonia Institute for Energy Research (IREC), C/ Jardins de les Dones de Negre 1, 2 <sup>a</sup> pl., 08930 Sant Adrià de Besòs, Barcelona, Spain	K 4.4	11:45	<b>Towards multi-coloured CIGS solar cells</b> Lena Merges <sup>1</sup> , Shilpi Shital <sup>1</sup> , Alice Debot <sup>1</sup> , Van Ben Chu <sup>1</sup> , Didier Arl <sup>2</sup> , Joana Ferreira <sup>1</sup> , Ricardo G. Poeira <sup>1</sup> , Omar Ramirez <sup>1</sup> , Hasan A. Yetkin <sup>1</sup> , Michele Melchiorre <sup>1</sup> , Phillip J. Dale <sup>1</sup> <sup>1</sup> Department of Physics and Materials Science, University of Luxembourg, Belvaux, L-4422, Luxembourg <sup>2</sup> Luxembourg Institute of Science and Technology, Materials Research and Technology Department, 41, rue du Brill, L-4422 Belvaux, Luxembourg	K 6.3
17:30	<b>Discussion</b>		12:00	<b>New Technology of Atom Probe Tomography Instrumentation and an Overview of Photovoltaic Applications</b> Larson, D.J.(1), Bunton, J.H.(1), Lenz, D.(1), Prosa, T.J.(1), Reinhard, D.A.(1), Martin, I.(1), Rice, K.P.(1), Clifton, P.H.(1), Chemnitz, R.(2), and Ulfig, R.M.*(1) (1)CAMECA Instrument Inc., USA (2)CAMECA SAS, France	K 6.4
			12:15	<b>Discussion</b>	
			12:30	<b>Lunch and Plenary</b>	
				<b>: Kesterites &amp; New Materials :-</b>	
			15:00	<b>Study of the Beneficial Effects of Sodium Doping Cu<sub>2</sub>ZnSnS<sub>4</sub> Material</b> M. Marzougui <sup>1</sup> , H. Hammami <sup>1</sup> , H. Oueslati <sup>1</sup> , M. Ben Rabeh <sup>*,1</sup> and M. Kanzari <sup>1,2</sup> <sup>1</sup> University of Tunis El Manar, National Engineering School of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia <sup>2</sup> University of Tunis, Preparatory Institute for Engineering Studies of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia	K 7.1
			15:00	<b>Synthesis and study of microstructural, optical and electrical properties of Na doped CZTS thin films via thermal evaporation</b> M. Marzougui, M. Ben Rabeh <sup>*,1</sup> and M. Kanzari <sup>1,2</sup> <sup>1</sup> University of Tunis El Manar, National Engineering School of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia <sup>2</sup> University of Tunis, Preparatory Institute for Engineering Studies of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia	K 7.2

15:00	<b>Growth and Characterization of Earth-abundant Quaternary Semiconductor Cu<sub>2</sub>XSnS<sub>4</sub> (M=Zn, Fe, Co and Ni) Thin Films via Thermal Vac</b> H. Oueslati <sup>1</sup> , M. Marzougui <sup>1</sup> , H. Hammami <sup>1</sup> , M. Ben Rabeh <sup>*1</sup> , and M. Kanzari <sup>2</sup> <sup>1</sup> University of Tunis El Manar, National Engineering School of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia <sup>2</sup> University of Tunis, Preparatory Institute for Engineering Studies of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia	K 7.3	16:00	<b>Different Morphological Growth of Molybdenum Disulfide via Aerosol-Assisted Chemical Vapour Deposition</b> Lewis Adams, Nilanthy Balakrishnan, Peter D. Matthews School of Chemical and Physical Sciences, Keele University, Keele, ST5 5BG, UK	K 7.16
15:00	<b>Structural characterization of the solid solution Cu<sub>2</sub>Mn(Ge<sub>x</sub>Sn<sub>1-x</sub>)S<sub>4</sub></b> David C. N. Matzdorff [1,2], Dr. Galina Gurieva [1], Dr. Denis Sheptikov [3], Prof. Dr. Susan Schorr [1,2] [1] Helmholtz-Zentrum Berlin für Materialien und Energie, Hahn-Meitner-Platz 1, 14109 Berlin, Germany (contact: david.matzdorff@helmholtz-berlin.de) [2] Institut für Geologische Wissenschaften, FU Berlin, Malteserstr. 74-100, 12249 Berlin, Germany [3] Paul Scherrer Institute, Forschungsstrasse 111, 5232 Villigen PSI, Switzerland	K 7.5	16:00	<b>Efficient ultrathin AgBiS<sub>2</sub> nanocrystal solar cells via cation disorder engineering (Fundamentals &amp; Theory)</b> Seán R. Kavanagh, Yongjie Wang, Ignasi Burgués-Ceballos, Gerasimos Konstantatos, Aron Walsh, David O. Scanlon Thomas Young Centre and Department of Chemistry, University College London, London WC1H 0AJ, U.K, Thomas Young Centre and Department of Materials, Imperial College London, London SW7 2AZ, U.K, ICFO-Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, Castelfelers, 08860 Barcelona, Spain, Department of Materials Science and Engineering, Yonsei University, Seoul 03722, Republic of Korea, ICREA-Institució Catalana de Recerca i Estudia Avançats, Lluís Companys 23, 08010 Barcelona, Spain	K 7.17
15:00	<b>Cu<sub>2</sub>FeSnS<sub>4</sub> (CFTS) thin films by sputtering technique for photovoltaic application</b> Luigi Frioni, Vanira Trifiletti, Giorgio Tseberlidis, Stefano Marchionna, Simona Binetti Università degli Studi di Milano Bicocca, Università degli Studi di Milano Bicocca, Università degli Studi di Milano Bicocca, RSE Spa, Università degli Studi di Milano Bicocca	K 7.6	16:00	<b>Sb<sub>2</sub>(S,Se)<sub>3-x</sub> thin films by sulfur replacement in Sb<sub>2</sub>S<sub>3</sub> using pulsed laser irradiated Se nanocolloids</b> Aiswarya Nadukkandy, Diana María Borunda Corral, Bindu Krishnan, Sadasivan Shaji, David Avellaneda Avellaneda, Josue Amilcar Aguilar-Martínez Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, 66455, México, Centro de Innovación, Investigación y Desarrollo en Ingeniería y Tecnología (CIIDIT)- Universidad Autónoma de Nuevo León, Parque de Investigación e Innovación Tecnológica (PIIT), Apodaca, Nuevo León, 66600, México.	K 7.19
15:00	<b>Investigation of the effects of Li-Na co-doping in CZTS solution-processed absorbers on performance and morphology</b> Simon Moser, Ayodhya N. Tiwari, Romain Carron Laboratory for Thin Films and Photovoltaics, Empa - Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129, 8600 Dübendorf, Switzerland	K 7.7	16:00	<b>Structural, morphological and Stability enhancement of CZTS thin film by appropriate PH adjustment for thin film application.</b> Shafi Ullah <sup>1</sup> , Muhammad Aamir Shafi <sup>2</sup> , Hanif Ullah <sup>3</sup> and Bernabé Mari <sup>1</sup> . <sup>1</sup> Instituto de diseño y Fabricación (IDF)-Universitat Politècnica de València (UPV) Camino de Vera, s/n 46022 Valencia, Spain. <sup>2</sup> COMSATS University Islamabad, Abbottabad Campus (CUI), Pakistan. <sup>3</sup> Department of Electrical Engineering, Federal Urdu University of Arts, Science and Technology, Islamabad, Pakistan.	K 7.20
15:00	<b>Growth and properties of Cu<sub>2</sub>NiSnS<sub>4</sub> (CNTS) films using spray pyrolysis</b> Outman El Khouja <sup>*(1, 2)</sup> , Khalid Nouneh <sup>(2)</sup> , Mohamed Ebn Touhami <sup>(2)</sup> , Abdelali Talbi <sup>(2)</sup> , Yassine Khaaissa <sup>(2)</sup> , Elena Matei <sup>(1)</sup> , Monica Enculescu <sup>(1)</sup> , Viorica Stancu <sup>(1)</sup> , Aurelian Catalin Galca <sup>(1)</sup> <sup>(1)</sup> National Institute of Materials Physics, Atomistilor 405A, 077125 Magurele, Romania, <sup>(2)</sup> Faculty of Science, Ibn Tofail University, Campus Universitaire, 14000 Kenitra, Morocco	K 7.9	17:00	<b>Influence of vapour transport deposition conditions on properties of Sb<sub>2</sub>Se<sub>3</sub> thin film absorber and solar cells</b> Sajeesh Vadakkedath Gopi, Nicolae Spalatu, Atanas Katerski, Malle Krunks and Ilona Oja Acik. Department of Materials and Environmental Technology, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia	K 7.21
15:00	<b>Sequential magnetron sputtering approach for the synthesis of Cu<sub>2</sub>ZnSnS<sub>4</sub> films</b> Mohamed Yassine Zaki <sup>*(1)</sup> , Florin Sava <sup>(1)</sup> , Iosif Daniel Simandan <sup>(1)</sup> , Angel Theodor Buruiana <sup>(1,2)</sup> , Claudia Mihai <sup>(1)</sup> , Alin Velea, Aurelian Catalin Galca <sup>(1)</sup> <sup>(1)</sup> National Institute of Materials Physics, Magurele, Romania, <sup>(2)</sup> Faculty of Physics, University of Bucharest, Magurele, Romania <sup>*</sup> lead presenter	K 7.10	17:00	<b>Development of Bismuth-based thin film semiconductor alloys for photovoltaic applications</b> Mykhailo Koltsov, Nicolae Spalatu, Jaan Hiie, Malle Krunks, Ilona Oja Acik. Department of Materials and Environmental Technology, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia	K 7.22
16:00	<b>Optical Constants of Cu<sub>2</sub>CoSnS<sub>4</sub> Thin Films Grown via Thermal Evaporation</b> H. Hammami <sup>1</sup> , M. Ben Rabeh <sup>*1</sup> , and M. Kanzari <sup>1,2</sup> <sup>1</sup> University of Tunis El Manar, National Engineering School of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia <sup>2</sup> University of Tunis, Preparatory Institute for Engineering Studies of Tunis, Photovoltaic and Semiconductor Materials Laboratory, 1002, Tunis, Tunisia	K 7.11	17:00	<b>Development of antimony sulfide thin-film solar cells for semi-transparent applications</b> <sup>*</sup> Robert Beglaryan, Atanas Katerski, Ilona Oja Acik, Malle Krunks Laboratory of Thin Film Chemical Technologies, Department of Materials and Environmental Technology, Tallinn University of Technology, Estonia	K 7.23
16:00	<b>Electron selective contacts based on transition metal oxides and amino acid dipoles for CZTSe solar cells.</b> Rosa Estefanía Almache, Benjamin Pusay, Eloi Ros, Kunal Tiwari, Alex Jimenez, Alejandro Pérez, Gerard Mastmitja, Cristóbal Voz, Edgardo Saucedo, Joaquin Puigdollers, Pablo Ortega Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Catalonia Institute for Energy Research (IREC), Catalonia Institute for Energy Research (IREC), Catalonia Institute for Energy Research (IREC), Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica, Universitat Politècnica de Catalunya (UPC), Departament d'Enginyeria Electrònica,	K 7.12	17:00	<b>Copper-related defects in ZnTe thin films grown by close space sublimation method</b> Ion Lungu, Lidia Ghimpu, Dumitru Untila and Tamara Potlog <sup>1</sup> Physics Department and Engineering, Moldova State University, MD-2009, Chisinau, Moldova <sup>2</sup> Institute of Electronic Engineering and Nanotechnologies, Academy of Sciences of Moldova, MD-2028, Chisinau, Moldova	K 7.24
16:00	<b>High-Quality Large-Area Growth of MoS<sub>2</sub> Monolayers using Combinational Phase Precursors based Chemical Vapor Deposition</b> Ary Anggara Wibowo <sup>(1)*</sup> , Mike Tebyetekerwa <sup>(2)</sup> , Anh D. Bui <sup>(1)</sup> , Sandra Saji <sup>(3)</sup> , Zongyou Yin <sup>(3)</sup> , Yuerui Lu <sup>(1)</sup> , Daniel Macdonald <sup>(1)*</sup> , and Hieu T. Nguyen <sup>(1)*</sup> <sup>(1)</sup> School of Engineering, The Australian National University, Canberra, ACT 2601, Australia <sup>(2)</sup> School of Chemical Engineering, The University of Queensland, St Lucia, Brisbane 4072, Australia <sup>(3)</sup> Research School of Chemistry, The Australian National University, Canberra, ACT 2601, Australia	K 7.13	17:00	<b>Gallium Sulphide layers by Close-Spaced Sublimation for UV Detector applications</b> Spoială, D.(1), Vatavu, E.(2), Ghilețchi, Gh.(1), Dmیتroglu, L.(1,2), Shapoval, O.(1), Belenchuk, A.(1), Rotaru, C.(1), Palamarciuc, O.(1), Narolschi, Ig.(1), Vatavu, S.*(1,3) <sup>(1)</sup> Physics of Semiconductors and Devices Lab, Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova, <sup>(2)</sup> Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova, <sup>(3)</sup> CaRISMA Research Center, Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova	K 7.25
			17:00	<b>Transition metal dichalcogenides for light harvesting applications</b> Ganesh Ghimire <sup>1</sup> , Denys I. Miakota <sup>1</sup> , Rajesh Ulaganatan <sup>1</sup> , and Stela Canulescu <sup>1</sup> Department of Photonics Engineering, Technical University of Denmark, DK-4000 Roskilde, Denmark	K 7.26



Wednesday June 1

**Kesterites : Phillip Dale - tbd**

- 09:00 **INV Band gap increase in kesterites through Ge alloying** K 8.1  
C. Platzer Björkman, N. Saini, J. K. Larsen  
Div. Solar Cell Technology, Dep Materials Science and Engineering Uppsala University
- 09:30 **Surface Electronic Characterisation of Cu<sub>2</sub>ZnSn(S,Se)<sub>4</sub> Films from Sn(II) and Sn(IV) precursors** K 8.2  
Alice Sheppard, Neil A. Fox, David J. Fermin  
School of Chemistry, University of Bristol, Cantock's Close, Bristol (UK) and H.H. Wills Physics Laboratory, University of Bristol, Tyndall Av., Bristol (UK), School of Chemistry, University of Bristol, Cantock's Close, Bristol (UK) and H.H. Wills Physics Laboratory, University of Bristol, Tyndall Av., Bristol (UK), School of Chemistry, University of Bristol, Cantock's Close, Bristol (UK)
- 09:45 **Crystallographic structure and point defects vs. efficiency and stability in Cu<sub>2</sub>ZnSn(S,Se)<sub>4</sub> monograin solar cells** K 8.3  
G. Gurieva<sup>1\*</sup>, K. Ernits<sup>2</sup>, N. Siminel<sup>3</sup>, A. Manjon Sanz<sup>4</sup>, D. Sheptyakov<sup>5</sup>, M. Kirkham<sup>4</sup>, D. Meissner<sup>2,6</sup>, S. Schorr<sup>1,7</sup>  
1 Helmholtz-Zentrum Berlin für Materialien und Energie, 14109 Berlin, Germany 2 crystalsol OÜ, 12618 Tallin, Estonia 3 Institute of Applied Physics, Academy of Sciences of Moldova, MD-2028 Chisinau, Moldova 4 Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA 5 Paul Scherrer Institute, 5232 Villigen PSI, Switzerland 6 Tallinn University of Technology, Tallin, Estonia 7 Freie Universität Berlin, Institute of Geological Sciences, 12249 Berlin, Germany
- 10:00 **Characterization of photogenerated carrier transport of Na passivated flexible Cu<sub>2</sub>ZnSn(S,Se)<sub>4</sub> thin film solar cells under mechan** K 8.4  
Ha Kyung Park 1, Yunaee Cho 1,2, Juran Kim 1, Sammi Kim 3, Kee-Jeong Yang 3, Dae-Hwan Kim 3, Jin-Kyu Kang 3, William Jo 1,2  
1 Department of Physics, Ewha Womans University, Republic of Korea, 2 New and Renewable Energy Research Center, Ewha Womans University, Republic of Korea, 3 Division of Energy Technology, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Republic of Korea
- 10:15 **Semi-transparent Cu<sub>2</sub>ZnGe(S,Se)<sub>4</sub> thin-film solar cells** K 8.5  
J.A. Segura (1), A. Ruiz-Perona (1), D. Palma (1), Y. Sánchez (2), R. Serna (3), M. Placidi (2,4), A. Thomere (2), T. Bertram (5), J.M. Merino (1), R. Caballero\*(1)  
(1) Universidad Autónoma de Madrid, Departamento de Física Aplicada, Spain (2) IREC, Catalonia Institute for Energy Research, Spain (3) Instituto de Óptica Daza de Valdés, CSIC, Spain (4) Universidad Politécnica de Cataluña, Spain (5) PVcomB-Helmholtz Zentrum Berlin für Materialien und Energie, Germany \*raquel.caballero@uam.es
- 10:30 **Discussion**
- 10:45

**: CIGSe & contact materials :-**

- 11:00 **Radio-frequency magnetron sputtering deposition process for In<sub>2</sub>O<sub>3</sub>:H transparent back contact for Cu(In,Ga)Se<sub>2</sub>-based solar cells** K 9.1  
Marina Alves\*(1, 2), Joaquim Carneiro (2), Vasco Teixeira (2), & Sascha Sadewasser (1)  
(1) International Iberian Nanotechnology Laboratory, Av. Mestre José Veiga s/n, Braga, Portugal (2) Centre of Physics of Minho and Porto Universities (CF-UM-UP), Azurém Campus, 4800-058 Guimarães, Portugal
- 11:00 **Electrical properties of CIGS<sub>2</sub> Solar Cells with different Ag/(Ag Cu) ratio** K 9.2  
Shih-Kai Lin, Jien-Han Siew, Tzu-Ying Lin  
Shih-Kai Lin, Advanced Thin Film Energy Materials Laboratory, Department of Materials Science and Engineering National Tsing Hua University, Hsinchu, Taiwan, Jien-Han Siew, Advanced Thin Film Energy Materials Laboratory, Department of Materials Science and Engineering National Tsing Hua University, Hsinchu, Taiwan, Tzu-Ying Lin, Advanced Thin Film Energy Materials Laboratory, Department of Materials Science and Engineering National Tsing Hua University, Hsinchu, Taiwan.
- 11:00 **Impact of heat soaking on Cu(In,Ga)(S,Se)<sub>2</sub> solar cells** K 9.3  
Jien Han Siew, Shih-Kai Lin, Tzu-Ying Lin\*  
Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

- 11:00 **Buffer Chemistry of Chemical Bath Deposition-CdS thin film on CIGS solar cells** K 9.4  
Yung-Hsuan Chen, Chi-Feng Hsieh, Jien-Han Siew, Tzu-Ying Lin  
Department of Materials Science and Engineering, National Tsing Hua University, 101, Sec. 2, Kuang-Fu Road, Hsinchu 30013, Taiwan R. O. C.
- 11:00 **Investigation and mitigation of sputter damage in CIGSe during deposition of window layers for photovoltaic devices** K 9.5  
Ramis Hertwig, Shiro Nishiwaki, Ayodhya N. Tiwari, Romain Carron  
Laboratory for Thin Films and Photovoltaics, Empa – Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129, 8600 Dübendorf, Switzerland
- 11:00 **Impact of Al, Mg and Sn doping on structural, optical, and electrical properties of n type ZnO films for optoelectronic devices** K 9.6  
G. El Hallani<sup>1</sup>, M. Khulili<sup>1</sup>, S. Nasih<sup>2</sup>, N. Fazouan<sup>1,2,\*</sup>, A. Liba<sup>1</sup>, L. Laanab<sup>3</sup>, O. Mounkachi<sup>4</sup>, A. Mzerd<sup>5</sup>, E. H. Atmani<sup>2</sup>.  
1 -Physical Materials Laboratory. Faculty of Sciences and Technologies, Beni Mellal, Morocco, 2- Physics of Condensed Matters and Renewables Energies Laboratory. Faculty of Sciences and Technologies, Mohammedia, Morocco, 3 -Conception Systems Laboratory, Faculty of Sciences, Rabat, Morocco, 4 -Condensed Matter and Interdisciplinary Sciences Laboratory, Faculty of Sciences, Rabat, Morocco, 5 -Physical Materials Laboratory. Faculty of Sciences, Rabat, Morocco.
- 11:00 **Fabrication of semi-transparent Cu(In, Ga)Se<sub>2</sub> solar cells aided by Bromine etching** K 9.7  
Pedro Santos (1)\*, Pedro Anacleto (1), Shilpi Shital (2), Alice Debot (2), Phillip J.Dale (2), Sascha Sadewasser (1)  
(1) International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga s/n, 4715-330 Braga, Portugal (2) Department of Physics and Materials Sciences, 41, rue du Brill L-4422 Belvaux, Luxembourg.
- 11:00 **Effect of Cu-In-Ga target composition on hybrid-sputtered Cu(In,Ga)Se<sub>2</sub> solar cells** K 9.8  
P. Santos (1), D. Brito (1), P. Anacleto (1), J. Fonseca (1), D. Brito Sousa (2), C.J. Tavares (2), J. Virtuoso (1,3), M. Alves (1,2), A. Pérez-Rodríguez (1), S. Sadewasser (1)  
(1) INL – International Iberian Nanotechnology Laboratory, Av. Mestre José Veiga s/n, 4715-330 Braga, Portugal, (2) Centre of Physics of the Minho and Porto Universities, Campus Azurém, 4804-533 Guimarães, Portugal, (3) Universidad Politécnica de Madrid, 28040 Madrid, Spain
- 12:00 **Lunch and Plenary**
- CdTe & alloys : Zakutayev Andriy - Reese Matthew**
- 15:00 **INV Te Alloys and Te Oxides to Enhance the Back-Contact of CdTe Cells** K 10.1  
James Sites  
Colorado State University
- 15:30 **Impact of metastable defect structures on carrier recombination in solar cells** K 10.2  
Seán R. Kavanagh,1,2 Aron Walsh,2 David O. Scanlon1 and Christoph Freysoldt3  
1. Thomas Young Centre and Department of Chemistry, University College London, 20 Gordon Street, London WC1H 0AJ, U.K. 2. Thomas Young Centre and Department of Materials, Imperial College London, Exhibition Road, London SW7 2AZ, U.K. 3. Max-Planck-Institut für Eisenforschung GmbH, Max-Planck-Str. 1, 40237 Düsseldorf, Germany
- 15:45 **Raman study of Cd<sub>1-x</sub>Zn<sub>x</sub>Te mixed crystal** K 10.3  
T. Alhaddad,1 M. B. Shoker,1 O. Pagès,1 A.V. Postnikov,1 A. Polian,2 S. Diliberto,3 A. En Naciri,1 L. Broch,1 P. Franchetti,1 A. Marasek,4 and K. Strzałkowski4  
1 Université de Lorraine, LCP-A2MC, ER 4632, F-57000 Metz, France 2 IMPMC, Sorbonne Université – UMR CNRS 7590, F-75005 Paris, France 3 IJL, UMR CNRS 7198, Université de Lorraine, F-54011 Nancy, France 4 Institute of Physics, N. Copernicus University, 87-100 Toruń, Poland
- 16:00 **Electronic properties of CdTe based detector structures by Kelvin Probe and Photoelectron Yield Spectroscopy** K 10.4  
Vatavu, S.\*(1,2), Rotaru, C.(1,2), Narolschi, Ig.(1), Ghilechii, Gh.(1), Bercu, E.(1), Nicorici, V.(1), Unold, T.(3), Rusu, M.(1,3)  
(1) Physics of Semiconductors and Devices Lab, Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova, (2) CaRISMA Research Center, Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova, (3) Struktur und Dynamik von Energiematerialien, Helmholtz-Zentrum Berlin für Materialien und Energie, Lise-Meitner Campus, Hahn-Meitner-Platz 1, 14109 Berlin, Germany

16:15	<b>Study of Cadmium Telluride-Embedded Copper Nanowire Interfaces for Photovoltaic Applications</b> Ana-Maria PANAITESCU (1), Iulia ANTOHE (2), Claudiu LOCOVEI (1,3), Sorina IFTIMIE (1), Stefan ANTOHE (1,4), Luc PIRAUX (5), and Vlad-Andrei ANTOHE (1,5,*) (1) University of Bucharest, Faculty of Physics, R&D Center for Materials and Electronic & Optoelectronic Devices (MDEO), Atomistilor Street 405, 077125 Magurele, Ilfov, Romania, (2) National Institute for Lasers, Plasma and Radiation Physics (INFLPR), Atomistilor Street 409, 077125 Magurele, Ilfov, Romania, (3) National Institute of Materials Physics (NIMP), Atomistilor Street 405A, 077125 Magurele, Ilfov, Romania, (4) Academy of Romanian Scientists (AOSR), Splaiul Independentei 54, 050094 Bucharest, Romania, (5) Université catholique de Louvain (UCLouvain), Institute of Condensed Matter and Nanosciences (IMCN), Place Croix du Sud 1, B-1348 Louvain-la-Neuve, Belgium, *Corresponding and contact author: vlad.antohe@fizica.unibuc.ro (V. A. ANTOHE).	K 10.5	17:00	<b>On the photovoltaic performances of CdTe/CdS heterojunction based devices – the effect of the transparent electrode</b> S. Iftimie1, A.M. Raduta1, A.M. Panaitescu1, I. Radulian1, C. Locovei1,2, V.A. Antohe1,3, A. Radu1, L. Ion1, and S. Antohe1,4 1University of Bucharest, Faculty of Physics, Bucharest-Magurele, Romania, 2National Institute of Materials Physics, Bucharest-Magurele, Romania, 3Catholic University of Louvain, Institute of Condensed Matter and Nanoscience, Louvain-la-Neuve, Belgium, 4Academy of Romanian Scientists, Bucharest, Romania	K 11.7
16:30	Discussion		17:00	<b>QUASIPARTICLE BOUND STATES IN THE SOLID STATE PHYSICS: a CdTe CASE STUDY</b> Klyukanov, A.A.(1), Varzari, A.(1), Vatavu, S.(1) (1) Physics of Semiconductors and Devices Lab, Faculty of Physics and Engineering, Moldova State University, 60 A. Mateevici str., MD 2009, Chisinau, Moldova	K 11.8
16:45			18:00	<b>E-MRS EU-40 Materials Prize &amp; MRS Mid-Career Researcher Award Presentations</b>	
17:00	<b>Investigating the origin of the N1 signature in admittance spectroscopy of CIGS solar cells by a variation of cell layers</b> Stephan J. Heise, Hippolyte Hirwa, Jörg Ohland Ultrafast Nanoscale Dynamics, Institute of Physics, University of Oldenburg, D-26111 Oldenburg, Germany	K 11.2			
17:00	<b>Raman study of the prospective Cd1-xBexTe (x≤0.07) semiconductor mixed crystal</b> A. Elmahjoubi(1), M.B. Shoker(1), O. Pagès(1), A. V. Postnikov(1), A. Polian(2), S. Diliberto(3), C. Gardiennet(4), G. Kervern(4), L. Broch(1), A. En Naciri(1), P. Franchetti(1), K. Strzałkowski(5), A. Marasek(5) 1 LCP-A2MC, Université de Lorraine, 57078 Metz, France. 2 IMPMC, Sorbonne Université – UMR CNRS 7590, F-75005 Paris, France 3 Institut Jean Lamour, Campus ARTEM, Université de Lorraine, 54011 Nancy, France. 4 Laboratory of Crystallography, Magnetic Resonance and Modelling, Université de Lorraine, 54500 Vandoeuvre-lès-Nancy, France. 5 Institute of Physics, N. Copernicus University, 87-100 Toruń, Poland.	K 11.4			
17:00	<b>Updated SCAPS baseline models reveal main differences between ultrathin, bifacial, and standard CIGS solar cells</b> André F. Violas (a,b,c,d), António J. N. Oliveira (a,b,c), Jennifer P. Teixeira (a), Tomás S. Lopes (a,e,f,g), João R. S. Barbosa (a), Marco A. Curado (a,h), António Vilanova (a), Margarida Monteiro (a), Diana Mesquita (a,i), Jenny A. M. Eriksson (j), Marika Edoff (d), Tobias Törndahl (d), Paulo A. Fernandes (a,b,k), Pedro M. P. Salomé (a,c) (a) INL – International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga, 4715-330 Braga, Portugal, (b) i3N, Departamento de Física, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal, (c) Departamento de Física da Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal, (d) Ångström Laboratory, Solid State Electronics, Ångström Solar Center, Uppsala University, Uppsala SE-751 21, Sweden, (e) Imec division IMOMEC (partner in Solliance), Wetenschapspark 1, 3590 Diepenbeek, Belgium, (f) Institute for Material Research (IMO), Hasselt University (partner in Solliance), Agaangebouw H, Diepenbeek, 3590, Belgium, (g) EnergyVille 2, Thor Park 8320, 3600 Genk, Belgium, (h) Department of Physics, University of Coimbra, CFisUC, P-3004-516 Coimbra, Portugal, (i) Departamento de Engenharia, Universidade do Minho, Campus de Azurém, 4800–058 Guimarães, Portugal, (j) Biology Education Centre, Uppsala University, Norbyvägen 14, 752 36 Uppsala, Sweden, (k) CIETI, Departamento de Física, Instituto Superior de Engenharia do Porto, Instituto Politécnico do Porto, Porto 4200-072, Portugal,	K 11.5			
17:00	<b>Sputtered CdO nanolayer as an interface engineering approach to CdTe solar cells</b> 1Amjad Al-Qassem, 2N. Spalatu, 3 V. Fedorov, 4R. Josepson, 1L. Gagara and 1T. Potlog 1Physics Department and Engineering Moldova State University Chisinau, MD 2009, Republic of Moldova 2 Department of Materials and Environmental Technology, Tallinn University of Technology, Ehitajate tee 5, 19086, Tallinn, Estonia 3Institute of Electronic Engineering and Nanotechnologies, Chisinau, MD-2028, Republic of Moldova 4 Division of Physics, Tallinn University of Technology, Ehitajate tee 5, 19086, Tallinn, Estonia	K 11.6			

Thursday June 2

Characterization : Abou-Ras Daniel - Oana Cojocaru-Miredin

- 09:00 **INV Nanoscale electronic properties of alkali-treated CIGSe thin-film solar cells investigated by advanced scanning probe microscopy** K 12.1  
N. Nicoara(1)\*, D. Sharma(1), R. Manaligod(1), P. Jackson(2), D. Hariskos(2), W. Witte(2), G. Sozzi(3), R. Menozzi(3), Sascha Sadewasser(1)  
(1)International Iberian Nanotechnology Laboratory, 4715-330 Braga, Portugal (2) Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, 70565 Stuttgart, Germany (3)University of Parma, 43124 Parma, Italy
- 09:30 **Peculiar bond length dependence in (Ag,Cu)GaSe<sub>2</sub> thin film alloys revealed by X-ray absorption spectroscopy** K 12.2  
Falk, H.H.\*(1), Eckner, S.(1), Ritter, K.(1), Levenco, S.(1), Pfeiffelmann, T.(1), Welter, E.(2), Shafarman, W.N.(3), Schnohr, C.S.(1).  
(1) Felix-Bloch-Institut für Festkörperphysik, Universität Leipzig, Germany, (2) Deutsches Elektronen-Synchrotron DESY - A Research Centre of the Helmholtz Association, Hamburg, Germany, (3) Department of Materials Science and Engineering, University of Delaware, Newark, USA
- 09:45 **Low temperature bias and frequency dependent admittance loss maps** K 12.4  
G. Brammert, R. Scaffidi, S. Hamtaei, Y. Wang, J. de Wild, M. Meuris, J. Poortmans, B. Vermang  
all authors are with: 1. imec division IMOMEC - partner in Solliance, Wetenschapspark 1, 3590 Diepenbeek, Belgium 2. Institute for Material Research (IMO) Hasselt University – partner in Solliance, Wetenschapspark 1, 3590 Diepenbeek, Belgium 3. EnergyVille, Thorpark 8310 & 8320, 3600 Genk, Belgium. J. Poortmans is also with: 4. Department of Electrical Engineering, KU Leuven, Kasteelpark Arenberg 10, 3001 Heverlee, Belgium.
- 10:00 **Chemical and Electronic Properties of Co-Evaporated In<sub>2</sub>Se<sub>3</sub> and RbInSe<sub>2</sub> Thin Films from Photoemission Spectroscopies and Kelvin P** K 12.5  
M. Rusu1, N. Maticiu2, T. Kodalle2, T. Bertram2, I. Simsek1, I. Lauer mann2, C. A. Kaufmann2, R. Schlatmann2, S. Schorr1,3, and T. Unold1  
1Department Structure and Dynamics of Energy Materials, Helmholtz-Zentrum Berlin für Materialien und Energie, Lise-Meitner Campus, Hahn-Meitner-Platz 1, 14109 Berlin, Germany 2Competence Centre Photovoltaics Berlin (PVcomB), Helmholtz-Zentrum Berlin für Materialien und Energie, Schwarzschildstr. 3, 12489 Berlin, Germany 3Institute of Geological Sciences, Freie Universitaet Berlin, Maltese St. 74-100, 12249 Berlin, Germany
- 10:15 **Discussion**
- 10:30
- New materials : Byungha Shin - tbd
- 11:00 **INV Emerging Chalcogenide Thin Films for Next Generation Photovoltaic Devices** K 13.1  
Lydia Helena WONG 1,2  
1 School of Materials Science and Engineering, Nanyang Technological University, Singapore, 2 Campus of Research Excellence and Technological Enterprise (CREATE), Singapore
- 11:30 **Efficient AgBiS<sub>2</sub> Nanocrystal Solar Cells via Cation Disorder Engineering** K 13.2  
Yongjie Wang\* (1), Seán R. Kavanagh (2, 3), Ignasi Burgués-Ceballos (1), Aron Walsh (3, 4), David Scanlon (2), Gerasimos Konstantatos (1, 5)  
(1) ICFO-Institut de Ciències Fòtiques, The Barcelona Institute of Science and Technology, Spain, (2) Thomas Young Centre and Department of Chemistry, University College London, U.K., (3) Thomas Young Centre and Department of Materials, Imperial College London, U.K., (4) Department of Materials Science and Engineering, Yonsei University, Republic of Korea, (5) ICREA-Institució Catalana de Recerca i Estudis Avançats, Spain. \* Lead presenter
- 11:45 **Elucidating the local structure of V substitutes in In<sub>2</sub>S<sub>3</sub> for intermediate band solar cells** K 13.3  
Ghorbani, E.(1), Schiller, M.(2,3), Falk, H.H.(2), Wägele, L.(3), Eckner, S.(2), Kempa, H.(3), d'Acapito, F.(4), Scheer, R.(3), Albe, K.(1) & Schnohr, C.S.\*(2).  
(1)Institut für Materialwissenschaft, Technische Universität Darmstadt, Germany, (2)Felix-Bloch-Institut für Festkörperphysik, Universität Leipzig, Germany, (3) Martin-Luther-Universität Halle-Wittenberg, Institut für Physik, Halle, Germany, (4) CNR-IOM-OGG c/o ESRF LISA CRG, Grenoble, France

- 12:00 **Atomic Layer Deposition of Cu<sub>2</sub>SnS<sub>3</sub> Thin Films: Effects of Composition and Heat Treatment on Phase Transformation** K 13.4  
Raphael Edem Agbenyeke, David J. Fermin\*  
School of Chemistry, University of Bristol, Cantock's Close, Bristol BS8 1TS, United Kingdom
- 12:15 **Close to energy gap band bending at SnS interface** K 13.5  
Issei Suzuki, Binxiang Huang, Sakiko Kawanishi, Takahisa Omata, Andreas Klein  
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai 980-8577, Japan, Department of Materials and Earth Science, Electronic Structure of Materials, Technical University of Darmstadt, Otto-Berndt-Str. 3, 64287 Darmstadt, Germany
- 12:30 **Discussion**
- 12:45 **Lunch and Plenary**
- Contact materials : Charlotte Platzer Björkman - tbd
- 15:15 **INV Co-optimization of alloy compositions of CdSe<sub>y</sub>Te<sub>1-y</sub> absorbers and MgxZn<sub>1-x</sub>O contacts in chalcogenide thin film solar cells** K 14.1  
Andriy Zakutayev  
National Renewable Energy Laboratory, Golden, CO, USA
- 15:45 **Mechanistic aspects of the solution deposition of Zn(O,S) as buffer for CIGS-based solar cells introducing oxidative and reducti** K 14.2  
Mariana Montoya-Gómez, Stefan Paetel, Wolfram Hempel, Ana Kanevce, Theresa Magorian-Friedlmeier, and Dimitrios Hariskos  
Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Meitnerstr. 1, 70563 Stuttgart, Germany
- 16:00 **Wide bandgap Cu(In)GaSe<sub>2</sub> solar cells with alternative front contacts** K 14.4  
Jackson Lontchi\* (1), Alexandre Crossay (2), Amelle Rebai (2), Nathanaelle Schneider (2), Damien Coutancier (2), Baptiste Berenguier (2), Polyxeni Tsoulka (3), Jean-Francois Guillemoles (2), Negar Naghavi (2), Nicolas Barreau (3), Daniel Lincot (2).  
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- 16:15 **Investigation of CuSbSe<sub>2</sub>/Zn<sub>1-x</sub>MgxO Interface for Photovoltaic Applications** K 14.5  
Ozge Surucu, Ayşenur Gencer, Gokhan Surucu  
Atılım University, Department of Electrical and Electronics Engineering, Ankara, Turkey, Karamanoglu Mehmetbey University, Department of Physics, Karaman, Turkey, Middle East Technical University, Department of Physics, Ankara, Turkey and Ahi Evran University, Department of Electric and Energy, Kirsehir, Turkey
- 16:30 **Discussion and Closing**