



European Materials Research Society

2024 Spring Meeting

May 27 - 31 / Strasbourg Convention Centre

SYMPOSIUM 0

Future photovoltaics based on earth abundant materials

Symposium Organizers:

Anna FONTCUBERTA I MORRAL, EPFL STI IMX LMSC, Lausanne, Switzerland

Esther ALARCON LLADO, NWO-I Institute AMOLF, Amsterdam, The Netherlands

Jordi ARBIOL (Main organizer), ICREA & Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Catalonia, Spain

Monday May 27

O01_Advanced PV material characterisation

MADRID 1 - GROUND FLOOR

Chairperson(s) : ALARCON-LLADO Esther - FONTCUBERTA I MORRAL Anna

08:45	2197	INV	Raman Spectroscopy at the Nanoscale: From Materials to Devices for Energy Conversion	DIMITRIEVSKA Mirjana
09:15	1450		Effects of cationic substitution on the properties of Sb _{1-x} BixSeI (x=0 to 1) compounds	DOLCET SADURNI Marc
09:30	815		Enhancement of hole mobility in high-rate reactively sputtered CuO ₂ thin films induced by high-power infrared laser	REZEK Jiri
09:45	1960		Large photoresponse and grain boundaries of LaFeO ₃ -based heterojunctions	VILLA NAVAS Mario

Monday May 27

O02_Silicon PVs

MADRID 1 - GROUND FLOOR

Chairperson(s) : ALARCON-LLADO Esther - DIMITRIEVSKA Mirjana

10:30	2539		Ultrathin a-Si:H Bifacial Transparent Solar Cells Exceeding 1.2% Light Utilization Efficiency for BIPV Applications	ALVAREZ SUAREZ Gustavo Hernando
10:45	1354		Tuning optoelectronic properties in type II Silicon Clathrate films for photovoltaic applications	BHARWAL Anil Kumar
11:00	691		Light harvesting and Electrical Contact for Crystal Silicon Solar Cell	SUN Baoquan
11:15	2294		Sputtered Molybdenum Oxide Films as dopant-free passivating and selective contact in SHJ Solar cells	LA MANNA Salvatore

Monday May 27
O03_Perovskite Photovoltaics

MADRID 1 - GROUND FLOOR

Chairperson(s) : BACH Udo - ESCOBAR STEINVALL Simon

13:45	1609	Exploring Radiation Hardness of Lead Halide Perovskites Under Exposure to Gamma Rays	OZEROVA Victoria
14:00	2850	Flexibility and Sustainability: Large-Area Perovskite Solar Cells as Next-Gen Photovoltaic Solutions	PAZ Sebastia-Luna
14:15	2630	Simultaneous Passivation of Perovskite Surface and Buried Interface through the Addition of Metal Formate.	AHN Jaewon
14:30	994	Giant thermal effects in the optoelectronic properties of chalcogenide anti-perovskite materials	BENÍTEZ COLOMINAS Pol
14:45	2734	Elucidating the Role of Contact-Induced Gap States at Perovskite/Metal Contacts	ROSAN PRADHAN Rakesh
15:00	250	Low-Temperature Solution Phase Synthesis of Inorganic Chalcogenide Perovskites Nanoparticles and Thin Films and Their Characterization	AGRAWAL Rakesh
15:15	2143	Intentional doping of pyrite FeS ₂ monograin powder crystals and its effect to material properties	KRISTMANN Katriin
15:30	3069	INV Halide Perovskite/MXene heterojunctions for stable solar cells for Stable Perovskite Solar Cells	RUIZ RAGA Sonia

Monday May 27
OP01_Poster session

ETOILE - FIRST FLOOR

16:30	01_101	120	01_101 Protective properties of thin oxide films and their composites for photoelectrodes	TUTLIENE Skirmante
16:30	02_1210	120	02_1210 Correlation of the structural and nanomechanical properties of the sustainable Cu ₃ N with its performance as efficient solar absorber	RODRIGUEZ Maria Isabel

16:30	03_1218	120	03_1218 Influence of the presence of voids in the Cu ₃ N microstructure on the sustainable solar absorber properties.	RODRIGUEZ Maria Isabel
16:30	04_1221	120	04_1221 Dependence of the optoelectronic Cu ₃ N Thin Films properties on their thermal transition point: evaluating a Cost-Effective Green Solar Absorber	RODRIGUEZ Maria Isabel
16:30	05_1268	120	05_1268 Scalability of selective area epitaxy of earth-abundant photovoltaic material Zn ₃ P ₂	URBONAVICIUS Aidas
16:30	06_1294	120	06_1294 Investigation of monolithic photovoltaic-photoelectrochemical-integrated Cu(In,Ga)Se ₂ -related co-planar device for hydrogen generation	UEDA Kana
16:30	07_1456	120	07_1456 The Design and Synthesis of Small Molecule Acceptor Materials based on N, S-heterocycles for Organic Solar Cells	ZHANG Jie
16:30	08_1466	120	08_1466 Wet synthesis of Cu ₂ MnSnS ₄ thin films for photovoltaics: oxidation control and CdS impact on device performances	TRIFILETTI Vanira
16:30	09_1649	120	09_1649 Design and Validation Plan for a 5kW Building Integrated Photovoltaics PV System	JEONG Chae Hwan
16:30	10_1692	120	10_1692 A Study on Optimization of HJT Cell Separation Using IR Laser	JEONG Chae Hwan
16:30	11_1789	120	11_1789 High Power Photovoltaic of Flexible c-Si Shingled Photovoltaic Modules for Vehicle Integrated Photovoltaic	SHIN Jin Ho
16:30	12_1980	120	12_1980 Formation of boron and phosphorus containing sol-gel solutions for spin-on-doping by rapid thermal annealing	SULTANOV Assanali
16:30	13_2057	120	13_2057 Modelling of pyramidal structure for Zn ₃ P ₂ solar cell	BAL LÓPEZ Marina
16:30	14_2063	120	14_2063 Work function and electrical properties dependence of Zn ₃ P ₂ thin films on the growing conditions	MICALI Melanie
16:30	15_2298	120	15_2298 Manipulation of TiO ₂ phases to improve pn junction quality in TiO ₂ /Sb ₂ Se ₃ solar cells.	NAUJOKAITIS Arnas
16:30	16_2362	120	16_2362 Efficient Tin-based Perovskite solar cells using back grooves and gold nanoparticles: FDTD-SCAPS numerical investigation	DJEFFAL Faycal
16:30	17_2598	120	17_2598 Synthesis and characterization of lead free perovskite materials for solar cells	ICHRAK Gassoumi

16:30	18_2678	120	18_2678 Study of multimodal light emissions from Pr ³⁺ /Yb ³⁺ -doped NaLa(MoO ₄) ₂ phosphors for LED and solar cell applications.	. Sonali
16:30	19_2693	120	19_2693 Radiative annihilation of the excitons in CdTe and the Mott transition	VATAVU Sergiu
16:30	20_2891	120	20_2891 Passivation of the laser induced damages using sputtered Al ₂ O ₃ for application in c-Si carrier selective IBC solar cell.	ANTONY Aldrin
16:30	21_3007	120	21_3007 Study of the physical properties of nanostructured copper oxide Cu ₂ O: Application to methanol detection	BENAMOR Moncef
16:30	22_317	120	22_317 Theoretical predictions of new chalcopyrite materials based solid solutions for photovoltaic applications	PISKUNOV Sergei
16:30	23_405	120	23_405 Characterization of Ga:CuInSe ₂ Films Prepared by Flash Evaporation for energy conversion applications	DINIA Selma
16:30	24_468	120	24_468 Wood-based Organic Solar Cells: Replacing the ITO on flexible Substrates	LANG Anna
16:30	25_778	120	25_778 Investigating YScS ₃ as a potential p-type transparent conducting material	TEATHER Eleanor
16:30	26_798	120	26_798 Crystalline Zn _{3-x} P _{2+x} grown by Van der Waals epitaxy on different graphene substrates	HAGGER Thomas

Tuesday May 28

O04_Thin film PV device architectures I

MADRID 1 - GROUND FLOOR

Chairperson(s) : ESCOBAR STEINVALL Simon - FONTCUBERTA I MORRAL Anna

08:45	1704	INV	Emerging kesterite thin film technologies for customised advanced PV integration: Custom-Art strategies	PEREZ-RODRIGUEZ Alejandro
09:15	1307		In-depth physical analysis of the current-voltage-temperature (IVT ^o) behaviour of kesterite thin-film solar cells	SCAFFIDI Romain
09:30	2333		Wide range band-gap tuning of high-efficiency kesterite solar cells from solution process	GONG Yuancai
09:45	2165		Li-alloyed kesterite (CZTSSe) for indoor applications: stability measurement and electronic characterization	CABAS VIDANI Antonio

Tuesday May 28

O05_Thin film PV device architectures II

MADRID 1 - GROUND FLOOR

Chairperson(s) : PEREZ-RODRIGUEZ Alejandro

10:30	2049	INV	Modelling and simulations of Zn3P2 based solar cells	MICALI Melanie
11:00	2140		Comparative study of solution and vacuum synthesis of thin-film kesterite solar cells	PAYNO David
11:15	1549		Application of Ag grading near the Cu2ZnSnS4/CdS interface for boosting the monograin layer (MGL) solar cell performance	MENGÜ Idil
11:30	1134		Bifacial solution-processed CZTSSe with a Cd-free buffer layer	SHEPPARD Alice
11:45	1606		Phosphosulfide photovoltaics: Cu ₃ PS ₄ thin films with long carrier lifetimes	CROVETTO Andrea

Tuesday May 28

O06_Advanced growth and synthetic methods for thin film PV

MADRID 1 - GROUND FLOOR

Chairperson(s) : ARBIOL Jordi - SPADARO Maria chiara

13:45	1874	INV	Nanoscale epitaxy as a tool to improve interfaces in earth-abundant photovoltaic materials	ESCOBAR STEINVALL Simon
14:15	2646		Influence of temperature-induced growth mechanism and materials chemistry on band gap characteristics in sputtered BaZrS ₃ chalcogenide perovskite thin films	MUKHERJEE Soham
14:30	3008		Comparative study between Silar and ALD methods for ZnSnO buffer layer deposition in chalcogenide thin film solar cells	SANCHEZ Yudania
14:45	2099		Effect of Mg concentration on the electronic properties of Zn(1-x)MgxO as a n-type layer for integration in CIGS and novel Sb ₂ S ₃ solar cells	TSEKOU Alexandra
15:00	2375		Thin film solar cells of SnS with Zn(O, S) and CdS-Zn(O, S) buffer layers.	LÓPEZ CRUZ Luis Arturo
15:15	2005		Secondary phases in chalcogenide solar cells and their effect on the device performance	KHELIFI Samira
15:30	1885		Combinatorially synthesized BaZrS ₃ thin films: Crystallization and defect properties	RÖTTGER Adriana
15:45	1315		Intrinsic doping and ageing of sputter deposited In ₂ O ₃ thin films	LO MASTRO Andrea

Tuesday May 28

O07_Growth Properties of Zinc-based solar cells

MADRID 1 - GROUND FLOOR

Chairperson(s) : ARBIOL Jordi - ESCOBAR STEINVALL Simon

16:30	1073	INV	In-depth electron nanoscopy investigations on Zn ₃ P ₂ nanostructures with photovoltaics application	SPADARO Maria Chiara
17:00	674		Zinc Phosphide Nanowires Grown via MOVPE: An In-Depth Study Through Transmission Electron Microscopy	SALUTARI Francesco

17:15	2082	The correlation between the microstructure and the electrical properties of monocrystalline Zn ₃ P ₂	LEMERLE Raphael
17:30	1797	A transmission electron microscopy study of Zn ₃ P ₂ thin films for green energy applications	RABELO Helena
17:45	2433	ZnSnN ₂ films grown by reactive Direct Current and High-Power Impulse Magnetron Sputtering for tandem solar cells: thermic vs ion-assisted synthesis	MANCARELLA Cristina
18:00	2798	Structural and electronic properties of ZnSnN ₂ thin films as function of composition and synthesis conditions	GHILETCHII Gheorghe
18:15	541	ZnMgO by ultrasonic spray pyrolysis as a buffer layer in sustainable thin-film solar cells: study of the temperature dependence of electrical transport properties	COLAS Victor

Wednesday May 29
O08_Perovskite Photovoltaics II

MADRID 1 - GROUND FLOOR

Chairperson(s) : MICALI Melanie - SPADARO Maria chiara

08:45	600	INV	Outdoor evaluation of perovskite photovoltaics	KYMAKIS Emmanuel
09:15	2022		Vacuum deposited wide bandgap perovskites films and solar cells	SESSOLO Michele
09:30	1782		Development of Cu-based conductive pastes for the interconnection of heterojunction and perovskite tandem solar cells	RONAYETTE Nathalie
09:45	168		Chalcogenide or oxysulfide perovskites, a new class of material for photovoltaics?	FIX Thomas

Wednesday May 29
O09_Sulfide and Selenide-based PV cells

MADRID 1 - GROUND FLOOR

Chairperson(s) : ALARCON-LLADO Esther - DIMITRIEVSKA Mirjana

10:30	1799		Investigation of crystallization and orientation of Sb_2S_3 absorbers and their photovoltaic performance	MAHESHKANT GUPTA Harshvardhan
10:45	1993		Selenization temperature effects on efficiency in Sb_2Se_3 photovoltaic devices	BONAL Víctor
11:00	2275		Effect of Sb:S precursors molar ratio in solution on Sb_2S_3 thin film and solar cells properties fabricated by ultrasonic spray pyrolysis	ADIYIAH ASARE Ernest
11:15	1627		Solution based synthesis of low dimensional pnictogen chalcogenides based on $(Sb,Bi)(S,Se)(Br,I)$ for sustainable energy applications	SAUCEDO Edgardo
11:30	1916		Investigation of Sb-Ge-Se thin films as absorber of photovoltaic devices	CABALLERO Raquel

Wednesday May 29
O10_Theory and AI applid to PVs

MADRID 1 - GROUND FLOOR

Chairperson(s) : BOTTI Silvana - MICALI Melanie

13:45	3070	INV	Computer-Aided Understanding of Interfacial Phenomena in Thin Film Solar Cells	DZADE Nelson
14:15	1020		Insights into the Intrinsic Properties of Zinc Phosphide from Ab Initio Calculations	KAWASHIMA Nico
14:30	2940		Alloying and off-stoichiometry in BaZrS3: an ab initio study	SOPIHA Kostiantyn
14:45	2584		Decoding the Spectrum: Statistical Analysis and Machine Learning Exploration of CdS Buffer Layer Impact on Cu ₂ ZnSnSe ₄ Photovoltaic Performance by Spectroscopic Techniques	VIDAL-FUENTES Pedro
15:00	464		Machine learning-aided first-principles prediction of earth-abundant chalcogenide-based solid solutions for photovoltaic multi-junction applications	LÓPEZ ÁLVAREZ Cibrán
15:15	547		Toward Intrinsic Intermediate-Band Materials for Solar Cells	CAGNONI Matteo