WP6

Lead beneficiary: UOXF

Deliverable: D6.6

Delivery date: 31/3/2020

Confidentiality level: Public

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

Revision History

Author Name, Partner short name	Description	Date
Clare Moloney	Draft deliverable	2/12/2019
Henry Snaith	Final version	27/03/2020

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

1. Overview

5th International Conference on Perovskite Solar Cells & Optoelectronics Lausanne, Switzerland, 1-3 October 2019

As part of the PerTPV project, the 5th International Conference on Perovskite Solar Cells and Optoelectronics took place in Lausanne, Switzerland from 1-3 October 2019. Over 450 delegates attended from all over the world.

The event took place over 3 days and the programme included a combination of invited talks, contributed talks and poster presentations in a meeting which brought a broad spectrum of the community together to discuss the latest advances in perovskite materials, devices and photophysical and optoelectronic properties and phenomena.

Invited speakers included:

Alex K.-Y. Jen - University of Washington / City University of Hong Kong
Antonio Abate - HZB, Germany
Aron Walsh - Imperial College London, UK
Barry P. Rand - Princeton University, USA
Christophe Ballif - EPFL, Switzerland
Edward Sargent - University of Toronto, Canada
Henk Bolink - University of Valencia, Spain
Henry Snaith - University of Oxford, UK
Jacky Even - INSA Rennes, France
Jianpu Wang - Nanjing Tech University, China
Jinsong Huang - University of North Carolina, USA
Joachim Maier - MPI for Solid State Research, Germany
Joseph M. Luther - National Renewable Energy Laboratory, USA
Maria Antonietta Loi - University of Groningen, Netherlands
Samuel Stranks - University of Cambridge, UK
Sang Il Seok - UNIST, Korea
Tae-Woo Lee - Seoul National University, Korea
Tom Aernouts - Imec, Belgium

The talks and poster sessions were accompanied by free and lively discussion which is ever more important in such a broad and multidisciplinary area of research.

The event was a fantastic platform for networking and everyone benefited tremendously from the wider interaction.

This international conference was in part funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977 of the PerTPV project.

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

Day 1 - September 30			
08.00-09.00	**Welcome and Registration**		
	Invited Lectures Session 1		
09.00-09.30	IL1.1	Edward Sargent	Perovskite light emission: Materials and devices
09.30-10.00	IL1.2	Joachim Maier	Ion Transport in Hybrid Perovskites: Bulk and Interface
10.00-10.30	IL1.3	Tom Aernouts	Perovskite PV technology in an overall energy supply system
10.30-11.00	***Coffee Break***		
11.00-11.30	IL1.4	Christophe Ballif	Perovskite-silicon multi-junction solar cells: progresses, opportunities and future market challenges
11.30-12.00	IL1.5	Sang Il Seok	□-phase stabilization of formamidinium lead iodide and trajectories for high efficiency solar cells
12.00-12.30	IL1.6	Aron Walsh	Quantum Mechanochemical Coupling in Halide Perovskites
12.30-12.45	***Sponsor Presentations***		
12.45-14.00	***Lunch***		
	Session A1 – Contributed Talks – in Auditorium C		
14.00-14.15	A1.01	Caleb Boyd	Improved Wide-Bandgap Perovskite Absorber for Perovskite-Silicon Tandem Solar Cells
14.15-14.30	A1.02	Ulrich Paetzold	Energy Yield Modelling of Perovskite-Based Tandem Photovoltaics
14.30-14.45	A1.03	Jan Christoph Goldschmidt	Perovskite silicon tandem solar cells with high-bandgap perovskite absorber exceeding 1.8 V open-circuit voltage
14.45-15.00	A1.04	Eike Köhnen	Highly Efficient Monolithic Perovskite Silicon Tandem Solar Cells: Analysing Current-Mismatch Conditions
15.00-15.15	A1.05	Elizabeth Tennyson	Evaluating the local optoelectronic response of textured perovskite/Si tandem solar cells
15.15-15.30	A1.06	Marko Jost	Designing highly efficient perovskite-based tandem solar cells
15.30-15.45	A1.07	Moritz Schultes	Minimizing Parasitic Near Infrared Absorption in Perovskite-CIGS Tandem Solar Cells
15.45-16.00	A1.08	Apolline Puaud	Junction engineering for monolithic perovskite/silicon tandem solar cells
16.00-16.30	***Coffee Break***		
16.30-16.45	A1.09	Harrie Gorter	Upscaling Stable Perovskite Solar Modules towards R2R
16.45-17.00	A1.10	Luca Bertoluzzi	Origin of the quasi-reversible performance losses induced by prolonged reverse bias in lead halide perovskite solar cells
17.00-17.15	A1.11	Annalisa Bruno	Scalable Thermally Evaporated Perovskite Solar Cells
17.15-17.30	A1.12	Richard Swartwout	Lower Toxicity Solvents for High Speed Manufacturing
	Session B1 – Contributed Talks – in Room Garden 2/3 ABC		
14.00-14.15	B1.01	Ajay Ram Srimath Kandada	Optical dephasing by many-body interactions of exciton polarons in 2D metal halide perovskites
14.15-14.30	B1.02	Giulia Grancini	2D/3D Hybrid Perovskite Interfaces and Physics therein for Stable and Efficient Solar Cells
14.30-14.45	B1.03	Michele Saba	Layered germanium hybrid perovskite bromides
14.45-15.00	B1.04	Hobeom Kim	Stable and Efficient Perovskite Solar Cells with 2D Perovskite as a Hole Transporting Material
15.00-15.15	B1.05	Justin Hoffman	From 2D to 1D Electronic Dimensionality in Halide Perovskites with Stepped and Flat Layers Using Propylammonium as a Spacer
15.15-15.30	B1.06	Antonio Agresti	2D material engineering for perovskite solar modules and panels
15.30-15.45	B1.07	Silvia Motti	Heterogeneous Photon Recycling and Charge Diffusion Enhance Charge Transport in Quasi-2D Lead-Halide Perovskite Films
15.45-16.00	B1.08	Laura Canil	Work Function Tuning through Self-Assembling Monolayers of Fluorinated Molecules
16.00-16.30	***Coffee Break***		
16.30-16.45	B1.09	Davide Moia	The device physics of hybrid perovskite interfaces: equivalent circuit model
16.45-17.00	B1.10	Alexander Urban	Charge carrier dynamics in thickness-controlled halide perovskite nanoplatelets
17.00-17.15	B1.11	Carola Lampe	Polymer nanoreactors shield perovskite nanocrystals from degradation
17.15-17.30	B1.12	Wolfgang Tress	Negative Capacitance in Perovskite Solar Cells
	RUMP Session 1 – in Auditorium C		
17.30-17.35	R1.01	Andreas Schiller	Design and analysis of perovskite-silicon tandem solar cells by full opto-electronic simulation

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

17.35-17.40	R1.02	Aslihan Babayigit	Hyperspectral photoluminescence imaging of spatial inhomogeneities in multi- cation and –anion perovskite absorbers
17.40-17.45	R1.03	Erkan Aydin	Zr-doped Indium Oxide (IZRO) Transparent Electrodes for Perovskite-Based Tandem Solar Cells
17.45-17.50	R1.04	Eros Radicchi	On the way to commercialization: the making of stable and efficient quasi-2D perovskite solar cells
17.50-17.55	R1.05	Heyong Wang	Perovskite-molecule hybrid thin films for efficient and stable solution-processed light-emitting diodes
17.55-18.00	R1.06	Janardan Dagar	Alkali-Salts as Interface Modifiers in Low Temperature Solution Processed n-i-p Hybrid Perovskite Solar Cells and Modules
18.00-18.05	R1.07	Onovbaramwen Jennifer Usiobo	Using high-resolution HIM-SIMS to understand the role and distribution of a CuSCN additive in reducing the hysteresis of mesoscopic HTM-free perovskites
18.05-18.10	R1.08	Sergii Yakunin	High-resolution remote thermometry and thermography using luminescent low-dimensional tin-halide perovskites
18.10-18.15	R1.09	Suhas Mahesh	Revealing the Origin of Voltage Loss in Wide-gap Perovskite Solar Cells
18.15-18.20	R1.10	Valentina Caselli	Temperature Dependent Rotational Relaxation Times of the Organic Cation in Lead Halide Perovskites
18.20-18.25	R1.11	Wenya Song	Investigation on stability of perovskite solar cells at outdoor settings
18.25-18.30	R1.12	Xiaoxin Gao	Stability and high-efficiency perovskite solar cells: interface modification and new materials
18.30-21.00	***Poster session & refreshment***		
21.00	***End of poster session***		

Day 2 - October 01			
08.00-09.00	**Welcome and Registration**		
	Invited Lectures Session 2		
09.00-09.30	IL2.1	Jinsong Huang	Multiple Facets Stability Issues of Metal Halide Perovskites and Mitigation Strategies
09.30-10.00	IL2.2	Alex Jen K.-Y.	Rational Design and Interface Engineering for High-Performance Perovskite and OPV/Perovskite Hybrid Solar Cells
10.00-10.30	IL2.3	Joseph M. Luther	Metal Halide Perovskites at the Nanoscale: high quality optoelectronic materials with unique distinctions from thin film perovskites
10.30-11.00	***Coffee Break***		
11.00-11.30	IL2.4	Maria Antonietta Loi	Scalable fabrication of high-quality crystalline and stable $FAPbI_3$ thin films
11.30-12.00	IL2.5	Barry P. Rand	Surface Passivation and Stability of Metal Halide Perovskite LEDs
12.00-12.30	IL2.6	Tae-Woo Lee	Boosting Efficiency of Polycrystalline Perovskite Light Emitting Diodes by Nanograin Engineering
12.30-12.45	***Sponsor Presentations***		
12.45-14.00	***Lunch***		
	Session A2 – Contributed Talks – in Auditorium C		
14.00-14.15	A2.01	Dane deQuilettes	GridEdge Solar- Scientific Insights into Scaling Perovskite Technology
14.15-14.30	A2.02	Carolin Rehermann	Understanding film formation of MAPb(I1-xBrx)3 via optical in-situ methods and its influence on thin film optoelectronic properties
14.30-14.45	A2.03	Dieter Neher	Probing Charge Carrier Dynamics in Efficient Perovskite Solar Cells
14.45-15.00	A2.04	Jan Herterich	Huge VOC increase despite almost constant radiative recombination in planar CsFAPbIBr solar cells
15.00-15.15	A2.05	Jose Marquez Prieto	Investigation of γ-CsPbI3 perovskites from coevaporation: low temperature deposition vs. high temperature annealing
15.15-15.30	A2.06	Ashley Marshall	Exploring the Non-cubic Perovskite Phases of CsPbI3
15.30-15.45	A2.07	Pietro Caprioglio	Interfacial Design through Poly-Ionic Liquid Surface Modification in Efficient pin Perovskite Solar Cells
15.45-16.00	A2.08	Wanchun Xiang	Europium-Doped CsPbI2Br for Stable and Highly Efficient Inorganic Perovskite Solar Cells
16.00-16.30	***Coffee Break***		
16.30-16.45	A2.09	Isabella Poli	Graphite-protected CsPbBr 3 perovskite photoanodes for oxygen evolution in water
16.45-17.00	A2.10	Diego Di Girolamo	Interfaces and Bulk. The Multivariate Effect of the Electrical Bias on Perovskite Film and on Perovskite Solar Cells
17.00-17.15	A2.11	Krzysztof Galkowski	Excitonic Properties of Low Bandgap Lead-Tin Halide Perovskites
17.15-17.30	A2.12	Mathias Uller Rothmann	Reliable Atomic-Resolution Scanning TEM Observations of the Nanoscopic Properties of Hybrid Perovskite Thin Films

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

17.30-17.45	A2.13	Lucie McGovern	Quantification of Ion Migration in MAPbBr3 solar cells with varying grain size
17.45-18.00	A2.14	Tom Savenije	Multi Bandgap Transitions Revealed by Two-Photon Absorption Spectra in Metal Halide Perovskites
Session B2 – Contributed Talks – in Room Garden 2/3 ABC			
14.00-14.15	B2.01	Edoardo Mosconi	Computational modelling of HTM/Perovskite interface: The role of methylammonium cation
14.15-14.30	B2.02	Saiful Islam	Partial A-Cation Substitution in Iodide Perovskites: Atomic-Scale Insights Into Structural Distortion, Iodide Ion Transport and Pressure Effects
14.30-14.45	B2.03	Nadège Marchal	Lead-halide perovskites meet donor-acceptor charge transfer complexes
14.45-15.00	B2.04	Mikael Kepenekian	Critical role of interfaces in halide perovskite-based devices
15.00-15.15	B2.05	Arup Mahata	Interface Engineering and Polaron Formation in 3D, 2D, and 3D/2D Mix-dimensional Perovskites
15.15-15.30	B2.06	Matthew Wolf	Band-Electron vs. Polaron Mobility in Metal-Halide Perovskites
15.30-15.45	B2.07	Damiano Ricciarelli	Ab initio defect chemistry of tin-halide perovskites: Origin of p-doping and possible material degradation pathways
15.45-16.00	B2.08	Keith McKenna	First principles modelling of grain boundaries in (FA/Cs)Pb(I/Br)3 perovskite solar absorbers
16.00-16.30	***Coffee Break***		
16.30-16.45	B2.09	Alex Barker	Competing photochemical reactions can be controlled to stabilise perovskite based optoelectronic devices
16.45-17.00	B2.10	Maksym Kovalenko	Perovskite Nanocrystals as Classical and Quantum Light Sources
17.00-17.15	B2.11	Jian Wang	Contact Improvement Rationales for Perovskite Solar Cells
17.15-17.30	B2.12	Alexey Tarasov	Room-temperature melts based perovskite processing: polyiodide-based approach as a mirror strategy to amine-based methods
17.30-17.45	B2.13	Dominik Kubicki	Atomic-level interaction between perovskites and passivation agents elucidated by multinuclear solid-state NMR
17.45-18.00	B2.14	Martin Stolterfoht	Quantification of bulk and interfacial recombination currents under open-circuit conditions of p-i-n and n-i-p type perovskite solar cells
18.00-19.00	***Poster session & refreshment***		
20.00-23.00	***Social Dinner***		

Day 3 - October 02			
08.00-09.00	**Registration**		
Invited Lectures Session 3			
09.00-09.30	IL3.1	Jacky Even	Excitons, phonons and confinement effects in halide perovskites: recent results
09.30-10.00	IL3.2	Samuel Stranks	Local Multi-Modal Approaches to Understand Halide Perovskite Device Operation
10.00-10.30	IL3.3	Henry Snaith	Understanding optoelectronic processes and improving the efficiency and stability of perovskite solar cells
10.30-11.00	***Coffee Break***		
11.00-11.30	IL3.4	Henk Bolink	Vapor Deposited Perovskites and their integration into Solar Cells
11.30-12.00	IL3.5	Antonio Abate	How much should we worry about lead from halide perovskites?
12.00-12.30	IL3.6	Jianpu Wang	Perovskite LEDs: High Efficiency and High Brightness
12.30-12.45	***Sponsor Presentations***		
12.45-14.00	***Lunch***		
Session A3 – Contributed Talks – in Auditorium C			
14.00-14.15	A3.01	Bernard Wenger	Light Soaking Effects and Passivation in Metal Halide Perovskites
14.15-14.30	A3.02	Marion Flatken	Structural Properties of Perovskite Layers in High-Performance Solar Cells
14.30-14.45	A3.03	Rachel Beal	Structural and mechanistic origins of light-induced phase segregation in organic-inorganic halide perovskite photovoltaic materials
14.45-15.00	A3.04	Wenxin Mao	Towards Single-crystalline Perovskite Devices
15.00-15.15	A3.05	Emanuele Smecca	Fully solvent-free preparation of MAPbI3 films for photovoltaic application
15.15-15.30	A3.06	Jeremie Werner	Improvement in the absorber and its interfaces to yield efficient and stable low-bandgap 1.2 eV tin-lead perovskite solar cells
15.30-15.45	A3.07	Ella Wassweiler	Fabrication of Perovskite Solar Cells Using Vapor Transport Deposition
15.45-16.00	A3.08	Laura Granados	Direct determination of total hemispherical emittance of perovskite and silicon solar cells
16.00-16.30	***Coffee Break***		
16.30-16.45	A3.09	Ana María Igual Muñoz	Sublimed tin-lead perovskite for energy harvesting applications
16.45-17.00	A3.10	Min Kim	Improving Stability of Lead Halide Perovskite Solar Cells based on 3D/2D Multi-dimensional Perovskite

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.

17.00-17.15	A3.11	Ening Gu	Robot-based high throughput screening of antisolvents applied in precipitation of lead halide perovskites
17.15-17.30	A3.12	Maurizio Monti	Influence of lead and tin concentration on hot carrier cooling in mixed lead-tin halide perovskite semiconductors
17.30-17.45	A3.13	Tadas Malinauskas	Long-term Instability of Doped Hole Transporting Materials and Means to Circumvent It via Hole-selective Monolayer
17.45-18.00	A3.14	Junke Wang	Fabrication and characterization of efficient low bandgap perovskite solar cells by a facial two-step solution process
Session B3 – Contributed Talks – in Room Garden 2/3 ABC			
14.00-14.15	B3.01	Sarah Deumel	Hybrid inorganic-organic perovskites as direct converter for medical X-Ray imaging
14.15-14.30	B3.02	Dávid Forgács	Artificial light harvesting perovskite modules for IoT applications – a promising market entry point
14.30-14.45	B3.03	Julie Roger	Flexible and stable laminated perovskite solar cells
14.45-15.00	B3.04	Philipp Brenner	Towards room temperature continuous wave perovskite lasers
15.00-15.15	B3.05	Gebhard Matt	High performance X-ray to current converter fabricated directly on substrate via melting of a inorganic metalhalide perovskite
15.15-15.30	B3.06	Giulia Longo	Co-evaporation of double-perovskites. An alternative deposition technique for the preparation and characterization of novel semiconductor materials
15.30-15.45	B3.07	Weidong Xu	Rational molecular passivation for perovskite light-emitting diodes
15.45-16.00	B3.08	Francesco Quochi	Photophysics of ytterbium(III) in the double perovskite Cs2NaYbCl6
16.00-16.30	***Coffee Break***		
16.30-16.45	B3.09	Michael F. Toney	Evidence for Local, Dynamic Tetragonal Domains within Cubic MAPbI3
16.45-17.00	B3.10	Dmitri Yakovlev	Spin-flip Raman scattering of carriers and excitons in CsPbBr3
17.00-17.15	B3.11	Amran Al-Ashouri	Universal Monolayer Contacts Form Lossless Hole-Selective Interfaces in Perovskite Solar Cells
17.15-17.30	B3.12	Satoshi Uchida	Crystal Phase Control Toward The Perovskite Superlattice Solar Cells
17.30-17.45	B3.13	Madeleine Laitz	Room-Temperature Strong Light-Matter Interactions in Hybrid Perovskites
17.45-18.00	B3.14	Marcel Roß	Influence of hole-selective contacts for Perovskite Solar Cells prepared by direct Co-Evaporation
18.00-18.30	***Awards announcements / Closing***		

The PerTPV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763977.