



International Conference on Hybrid and Organic Photovoltaics (HOPV19)

Roma, Italy, 2019 May 12th - 15th

Conference Chairs: Prashant Kamat, Filippo De Angelis and Aldo Di Carlo

Conference Program

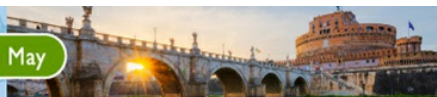
May 12th - Day 1 (Sunday)	
16:00 - 17:30	Registration
17:00 - 18:30	Welcome
May 13th - Day 2 (Monday)	
07:45 - 08:45	Registration
08:45 - 08:50	Announcement of the day
08:50 - 09:00	Opening
Session G1.1	
09:00 - 09:45 G1.1-K1	<u>Tsutomu Miyasaka</u> (<i>Graduate School of Engineering, Toin University of Yokohama, 1614, Kurogane-cho, Aoba, Yokohama, Kanagawa, Japan 225-8503</i>) Focusing key directions of perovskite photovoltaic R&Ds towards industrialization
09:45 - 10:15 G1.1-I1	<u>Tom Aernouts</u> (<i>imec (partner in Solliance & EnergyVille), Kapeldreef 75, Leuven, 3001, Belgium.</i>) Efficient Structures and Processes for Reliable Perovskite Solar Modules
10:15 - 10:45 G1.1-I2	<u>James Durrant</u> (<i>Department of Chemistry and Centre for Plastic Electronics, Imperial College London</i>) Charge Carrier Dynamics in Disordered Materials for Solar Energy Conversion
10:45 - 11:15	Coffee Break
Session G1.2	
11:15 - 11:45 G1.2-I1	<u>Jinsong Huang</u> (<i>University of North Carolina – Chapel Hill</i>) Defect Passivation in Halide Perovskites
11:45 - 12:15 G1.2-I2	<u>Masaru Kuno</u> (<i>Radiation Laboratory, Department of Chemistry & Biochemistry, University of Notre Dame</i>) Microscopic Measurements of Hybrid Perovskite Solar Cells
12:15 - 12:45 G1.2-I3	<u>Henk Bolink</u> (<i>Instituto de Ciencia Molecular (ICMol), Universidad de Valencia</i>) Vapor Phase Deposited Single Junction and Tandem Perovskite Solar Cells.
12:45 - 13:00 G1.2-S1	<u>Luca Sorbello</u> (<i>Great Cell Solar</i>) Hyperion a bright future for solar simulators: The Greatcell Solar Italia way
13:00 - 14:30	Lunch Break
Session A1	
14:30 - 15:00 A1-IS1	<u>Daniele Meggiolaro</u> (<i>D3-CompuNet, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova</i>) Defects Chemistry and Charge Traps in MA(Pb,Sn)I ₃ Perovskites: A Computational Perspective
15:00 - 15:15 A1-O1	<u>Silvia Motti</u> (<i>Department of Physics, University of Oxford</i>), Daniele Meggiolaro, Alex Barker, Carlo Perini, James Ball, Marina Gandini, Roberto Sorrentino, Min Kim, Filippo de Angelis, Annamaria Petrozza Defect Activity in Lead Halide Perovskites
15:15 - 15:30 A1-O2	<u>Mohammad Sajedi Alvar</u> (<i>Max Planck Institute for Polymer Research, Ackermannweg10, 55128 Mainz, Germany</i>), Gert Jan Wetzelaer, Paul Blom Concentration and Mobility of Ions in Methylammonium Lead Iodide Thin Films from Dielectric Response



- 15:30 - 15:45 Alessandro Senocrate (*Max Planck Institut for Solid State Research*), Igor Moudrakovski, Tolga Acartuerk, Gee A1-O3 Yeong Kim, Rotraut Merkle, Ulrich Starke, Michael Graetzel, Joachim Maier
Slow methylammonium migration in methylammonium lead iodide in the dark and under illumination
- 15:45 - 16:00 Moritz Futscher (*Center for Nanophotonics, AMOLF, Science Park 104, 1098 XG Amsterdam, The Netherlands*), A1-O4 Lucie McGovern, Kangyu Ji, Sandy Sanchez, Sam Stranks, Bruno Ehrler
Ion Migration in Triple-Cation Mixed-Halide Perovskite Solar Cells with Potassium Passivation
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 Prashant V. Kamat (*Radiation Laboratory, Department of Chemistry & Biochemistry, University of Notre Dame*), A1-O5 Rebecca Scheidt, Gergely Samu, Csaba Janaky
Halide Ion Migration in Mixed Halide Lead Perovskites
- 16:45 - 17:00 Waldemar Kaiser (*Department of Electrical and Computer Engineering, Technical University of Munich*), A1-O6 Nga Phung, Antonio Abate, Alessio Gagliardi
3D simulation of ion migration within the microstructure of perovskite solar cells
- 17:00 - 17:15 Gee Yeong Kim (*Max Planck Institute for Solid State Research, Physical Chemistry of Solid, Stuttgart, 70569, Germany*), A1-O7 Alessandro Senocrate, David Moia, Joachim Maier
Equilibrium space charges effect at halide perovskite interactions: The role of ionic charge carriers
- 17:15 - 17:30 Terry Chien-Jen Yang (*École Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), Photovoltaics and Thin-Film Electronics Laboratory (PV-Lab), Rue de la Maladière 71b, Neuchâtel 2002, Switzerland*), A1-O8 Pietro Caprioglio, Fan Fu, Peter Fiala, Martin Stollerfoht, Florent Sahli, Ricardo Razera, Matthias Bräuninger, Steve Albrecht, Dieter Neher, Quentin Jeangros, Christophe Ballif
Photoinduced Halide Segregation and Diffusion in Mixed-halide Perovskite Solar Cells

Session B1

- 14:30 - 14:45 Ilker Dogan (*TNO Solliance*), B1-O7 Francesco Di Giacomo, Henri Fledderus, Harrie Gorter, Gerwin Kirchner, Ike de Vries, Sjoerd Veenstra, Pim Groen, Ronn Andriessen, Yulia Galagan
Roll-to-roll slot-die coating of perovskite solar cells with efficiencies up to 13.5%: perspectives from the current status and further potential improvements
- 14:45 - 15:00 Felix Utama Kosasih (*Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, United Kingdom*), B1-O8 Lucija Rakocevic, Jef Poortmans, Caterina Ducati
Visualisation and Elemental Analysis of Perovskite Damage in Laser Scribing of Perovskite Solar Modules
- 15:00 - 15:15 Fabio Matteocci (*CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata*), B1-O1 Emanuele Calabrò, Diego Di Girolamo, Enrico Lamanna, Danilo Dini, Aldo Di Carlo
Long-Term Stability of Large Area Perovskite Solar Cell under Thermal Stress
- 15:15 - 15:30 Florent Sahli (*Ecole Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT) Photovoltaics and Thin-Film Electronics Laboratory (PV-Lab), Neuchâtel, Switzerland*), B1-O2 Gizem Nogay, Jérémie Werner, Fan Fu, Arnaud Walter, Saeid Rafizadeh, Vincent Paratte, Raphaël Monnard, Brett A. Kamino, Peter Fiala, Terry Chien-Jen Yang, Matthias Bräuninger, Ricardo A. Z. Razera, Matthieu Despeisse, Sylvain Nicolay, Mathieu Boccard, Andrea Ingenito, Quentin Jeangros, Christophe Ballif
Perovskite/Silicon Monolithic Tandem Based on a P-type High-temperature Tolerant Silicon Bottom Cell
- 15:30 - 16:00 Francesco Di Giacomo (*TNO – partner in Solliance, PO Box 8550, 5605KN Eindhoven, The Netherlands*), B1-IS1 Henri Fledderus, Ilker Dogan, Wiljan Verhees, Valerio Zardetto, Claire Burgess, Meherdad Najafi, Dong Zhang, Harrie Gorter, Gerwin Kirchner, Ike de Vries, Herbert Lifka, Yulia Galagan, Tom Aernouts, Mariadriana Creatore, Pim Groen, Sjoerd Veenstra, Ronn Andriessen
Towards Stable Perovskite Solar Modules Made by Sheet to Sheet and Roll to Roll Fabrication
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 Laurence Lutsen (*IMEC, Imomec, Diepenbeek (Belgium)*), B1-O3 Dirk Vanderzance, Wouter Van Gompel, Roald Herckens, Paul-Henri Denis, Martijn Mertens, Tom Aernouts, Jan D'Haen, Bart Ruttens, Kristof Van Hecke
Towards 2D Layered Hybrid Perovskites with Enhanced Functionality



16:45 - 17:00 B1-O4	<u>Antonio Agresti</u> (<i>CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata</i>), Sara Pescetelli, Hanna Pazniak, Danina Saranin, Daniele Rossi, Matthias Auf der Maur, Alessia Di Vito, Alessandro Pecchia, Andrea Liedl, Rosanna Larciprete, Aldo Di Carlo 2D material engineering of perovskite solar cells: the emergence of MXenes
17:00 - 17:15 B1-O5	<u>Lukas Helmbrecht</u> (<i>AMOLF</i>), Hans C. Hendrikse, Tim Holtus, Iaroslav Baglai, Sophie Meuret, Gede W. P. Adhyaska, Erik C. Garnett, Wim L. Noorduin A Bio-Inspired Route to 3D Lead-Halide Perovskites
17:15 - 17:30 B1-O6	Saba Gharibzadeh, Bahram Abdollahi Nejand, Marius Jackoby, Tobias Abzieher, Somayeh Moghadamzadeh, Jonas A. Schwenzler, Philipp Brenner, Raphael Schmager, Amir Abbas Haghighirad, Uli Lemmer, Bryce S. Richards, Ian A. Howard, <u>Ulrich W. Paetzold</u> (<i>Karlsruhe Institute of Technology (KIT), Institute of Microstructure Technology (IMT), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany</i>) 2D/3D Perovskite Heterostructures for High Performance and High Open Circuit Voltage in Wide-Bandgap Perovskite Photovoltaics
Session C1	
14:30 - 14:45 C1-O8	<u>Luiza de Queiroz Correa</u> (<i>CSEM Brasil</i>), Juliana Luiza da Silva Martins, Gabriela de Amorim Soares, Barbara Hellen de Souza Miranda, Diego Bagnis Electron transport material modification for high-efficiency and stable flexible P3HT:O-IDTBR polymer solar cells blade coated in air from non-halogenated solvents
14:45 - 15:00 C1-O7	<u>Elena Barulina</u> (<i>Aix-Marseille Univ., UMR CNRS 7325, Centre Interdisciplinaire de Nanosciences de Marseille (CINaM), 13009 Marseille Cedex 09, France</i>), Pavlo Perkhun, Wolfgang Köntges, Martin Pfanmüller, Sadok Ben Dkhil, Jean-Jacques Simon, Olivier Margeat, Christine Videlot-Ackermann, Jörg Ackermann A detailed stability study of highly efficient polymer solar cells based on ITIC derivatives
15:00 - 15:15 C1-O1	Jochen Kammerer, Rasmus Schröder, Irene Wacker, Riva Alkarsifi, Pavlo Perkhun, Christine Videlot-Ackermann, Olivier Margeat, Jörg Ackermann, <u>Martin Pfanmüller</u> (<i>Centre for Advanced Materials (CAM), Heidelberg University, Heidelberg, Germany</i>) Visualizing the surface morphology of non-fullerene acceptor blends by automated segmentation of spatially resolved electron spectra from ultra-low voltage scanning electron microscopy
15:15 - 15:30 C1-O2	<u>Giuseppina Polino</u> (<i>CHOSE - Centre for Hybrid and Organic Solar Energy, University of Rome "Tor Vergata", Electronic Engineering Department</i>), Luca La Notte, Simone Dell'Elce, Andrea Liscio, Giorgio Cardone, Babak Taheri, Aldo Di Carlo, Andrea Reale, Francesca Brunetti Fully Spray-Coated Organic Photovoltaic Cells with Green Solvents: Study of Interfaces and Scale-Up
15:30 - 15:45 C1-O3	<u>Andreas Schiller</u> (<i>Institute of Computational Physics, Zurich University of Applied Sciences (ZHAW), 8401 Winterthur (Switzerland)</i>), Balthasar Blülle, Christoph Kirsch, Martin Neukom, Beat Ruhstaller Accumulation of ionic charge carriers and the influence of steric potential in perovskite solar cells
15:45 - 16:00 C1-O4	<u>Benjamin Daiber</u> (<i>Center for Nanophotonics, AMOLF, Science Park 104, 1098 XG Amsterdam, The Netherlands</i>), Koen v.d. Hoven, Moritz H. Futscher, Bruno Ehrler Efficiency Potential of Singlet Fission Enhanced Silicon Solar Cells using Different Energy Transfer Schemes
16:00 - 16:30	Coffee Break
16:30 - 17:00 C1-IS1	<u>Aleksandra Djurisić</u> (<i>Department of Physics, The University of Hong Kong</i>), Fangzhou Liu, Ho Won Tam, Tik Lun Leung Towards Improved Stability of Organic-Inorganic Perovskite Solar Cells
17:00 - 17:15 C1-O5	<u>Juliane Bocher</u> (<i>Clarendon Laboratory, Department of Physics, Oxford University, Oxford OX1 3PU, UK</i>), Ievgen Levchuk, Lavina C. Snoek, Mathias Uller Rothmann, Henry J. Snaith, Christoph J. Brabec, Laura M. Herz, Michael B. Johnston Impurities and their influence on the co-evaporation of methylammonium perovskite thin-film solar cells
17:15 - 17:30 C1-O6	<u>Moitaba Abdi-Jalebi</u> (<i>Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK.</i>), M. Ibrahim Dar, Satyaprasad P. Senanayak, Henning Siringhaus, Michael Grätzel, Richard H. Friend Highly Luminescent and Stable Metal Halide Perovskite Devices via Graded Hole Transport Layers
17:30 - 19:00	Poster Session

**May 14th - Day 3 (Tuesday)**08:55 - 09:00 **Announcement of the day****Session G2.1**09:00 - 09:45 Mercouri Kanatzidis (*Department of Chemistry, Northwestern University, Evanston, IL 60208, USA.*)

G2.1-K1 Chemistry and Devices from Low Dimensional Halide Perovskites Semiconductors

09:45 - 10:15 Naomi Ginsberg (*Department of Physics, University of California, Berkeley, USA*), Milan Delor, Connor Bischak, Minliang Lai, Hannah Weaver, Dylan Lu, QinQin Yu, Peidong Yang, David Limmer
G2.1-I1 Resolving Carrier Dynamics in Metal Halide Perovskites to Elucidate Structural Transformation Mechanisms and the Impact of Structural Heterogeneity on Transport10:15 - 10:45 Nitin Padture (*Brown University*)

G2.1-I2 Nano-/Micro-structural Tailoring of Pb-based and Pb-free Multi-dimensional Halide Perovskites for Scalable, Efficient, and Stable Solar Cells

10:45 - 11:15 **Coffee Break****Session G2.2**11:15 - 11:45 Aditya Mohite (*RICE UNIVERSITY*)

G2.2-I1 From RT hysteresis free FETs to tailoring phase purity and orientation in layered 2D perovskites

11:45 - 12:15 Liberato Manna (*Department of Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova (Italy)*)

G2.2-I2 Halide Perovskite Nanocrystals: Their Synthesis, Chemical, Structural, and Surface Transformations

12:15 - 12:45 Osman M. Bakr (*Materials Science and Engineering, King Abdullah University of Science and Technology (KAUST), Saudi Arabia*)

G2.2-I3 Nanoscale and Bulk Perovskite Single-Crystals: Surface Engineering for Efficient LEDs, Photodetectors, and Solar Cells

12:45 - 13:00 Taro Tanabe (*TCI*)

G2.2-S1 TCI Industry talk

13:00 - 14:30 **Lunch Break****Session A2**14:30 - 15:00 Nadia Barbero, Raffaele Borrelli, Vittoria Novelli, Simone Galliano, Matteo Bonomo, Guido Viscardi, Claudia Barolo (*Dipartimento di Chimica, NIS Interdepartmental and INSTM Reference Centre, Università degli Studi di Torino, Via Pietro Giuria 7, 10125 Torino, Italy*), Frederic Sauvage
A2-IS1 Near Infra-Red Dyes in Dye-Sensitized Solar Cells: from Panchromatic Absorption to Completely Transparent DSSCs15:00 - 15:15 Nicola Sangiorgi (*ISTEC-CNR, Institute of Science and Technology for Ceramics, National Research Council of Italy, Via Granarolo 64, 48018 Faenza, RA, Italy.*), Alex Sangiorgi, Alessandra Sanson
A2-O1 Molecular Imprinted Polypyrrole Counter Electrode for Quasi-Solid DSSCs15:15 - 15:30 Peter Holliman (*College of Engineering, Swansea University, Bay Campus, Swansea, SA1 8EN, UK*), Christopher Kersahw, Diana Meza-Rojas, Rosie Anthony, Eurig Jones, Leo Furnell, Arthur Connell, James McGettrick, Dawn Geatches, Sebastian Metz, Kakali Sen
A2-O2 Surface Engineering Dye-sensitized Solar Cells15:30 - 15:45 Ana Lucia Pinto (*LAQV-REQUIMTE, Departamento de Química, Faculdade de Ciências e Tecnologia, Universidade NOVA de Lisboa, 2829-516 Caparica, Portugal.*), Luis Cruz, Vânia Gomes, Hugo Cruz, Giuseppe Calogero, Victor de Freitas, A. Jorge Parola, Fernando Pina, J. Carlos Lima
A2-O3 On the Role of the Anchoring Unit in the Efficiency of Pyranoanthocyanin-based Dye-Sensitized Solar Cells15:45 - 16:00 Matteo Bonomo (*University of Turin, Department of Chemistry and NIS Interdepartmental Center*), Emmanuel Ekoi, Claudia Barolo, Denis Dowling, Danilo Dini, Aldo Di Carlo
A2-O4 Effect of the Sintering Procedure on the Photoelectrochemical Performances of Nanostructured Mixed Oxides as Photocathodes of p and Tandem Dye-Sensitized Solar Cells with Superior Conversion Properties



- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 Sreelakshmi Chandrabose, Kai Chen, Alex J. Barker (*Center for NanoScience and Technology, Italian Institute of Technology, Via Pascoli 70/3, 20133 Milano, Italy*), Joshua J. Sutton, Shyamal Prasad, Jingshuai Zhu, Keith C. Gordon, Zenqi Xie, Xiaowei Zhan, Justin M. Hodgkiss
A2-O5 Facile Exciton Diffusion in Fused Ring Electron Acceptor Films
- 16:45 - 17:00 Philip Bellchambers (*Department of Chemistry, University of Warwick, CV4 7AL, Coventry, United Kingdom*),
A2-O6 Silvia Varagnolo, Ross Hatton
High-Performance Cu Mesh Transparent Conductive Electrodes for Flexible Organic Photovoltaics
- 17:00 - 17:15 Enrique Pascual-San-José (*Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)*), Xabier Rodríguez-
A2-O7 Martínez, Fei Zhuping, Martin Heeney, Roger Guimerà-Manrique, Mariano Campoy-Quiles
High Throughput Screening of Highly Efficient Non-fullerene Acceptor based Organic Solar Cells Assisted by a Multi-Dataset Scientific Robot
- 17:15 - 17:30 Kieran Walsh (*School of Physics, University of Exeter*), Conor Murphy, Adolfo De Sanctis, Christos Melios,
A2-O8 Saverio Russo, Monica Craciun
FeCl₃ intercalated graphene electrodes for photovoltaic energy harvesting

Session B2

- 14:30 - 14:45 Juan F. Galisteo-López (*Instituto de Ciencia de Materiales de Sevilla, Consejo Superior de Investigaciones Científicas*), Mauricio E. Calvo, Cristina T. Rojas, Hernán Míguez
B2-O7 Mechanism of Photoluminescence Intermittency in Organic-Inorganic Perovskite Nanoparticles
- 14:45 - 15:00 Manon Spalla (*LEPMI / Université Savoie Mont Blanc*), Lara Perrin, Emilie Planes, Muriel Matheron, Solenn
B2-O8 Berson, Lionel Flandin
Stability of mixed cation perovskite solar cells: understanding of involved mechanisms
- 15:00 - 15:15 Endre Horvath (*EPFL SB IPHYS LPMC*), Massimo Spina, Balint Nafradi, Eric Bonvin, Marton Kollar, Andrzej
B2-O1 Sienkiewicz, Konstantins Matulnikovs, Anastasiia Glushkova, Alla Arakcheeva, Zsolt Szekrenyes, Hajnalka Tohati, Katalin Kamaras, Richard Gaal, Pavao Andricevic, Rita Smajda, Raphael Pugin, Laszlo Forro
Lead halide perovskite nanowires: quest for liquid phase wafer-scale epitaxial growth
- 15:15 - 15:30 Quinten A. Akkerman (*Department of Nanochemistry, Istituto Italiano di Tecnologia (IIT), via Morego 30, I-16163*
B2-O2 *Genova, Italy*), Liberato Manna
Beyond the crystal lattice of lead halide perovskites: The curious cases of Cs₄PbX₆, Cs(Pb:Mn)I₃, Cs₂PbI₂Cl₂ and CsPb(Cl:Br)I₃ nanocrystals
- 15:30 - 16:00 Angshuman Nag (*Department of Chemistry, Indian Institute of Science Education and Research (IISER), Pune*
B2-IS1 *411008, India*)
Mn- and Yb- Doping in Metal Halide Perovskite Nanocrystals
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 Ajay Jena (*Graduate School of Engineering, Toin University of Yokohama, 1614, Kurogane-cho, Aoba,*
B2-O3 *Yokohama, Kanagawa, Japan 225-8503*), Tsutomu Miyasaka
Performance Deterioration and Stability issues with Organic-inorganic hybrid and All-inorganic Perovskite Solar Cells
- 16:45 - 17:00 Eline Hutter (*Center for Nanophotonics, AMOLF, 1098 XG Amsterdam, The Netherlands*), Maria Gelvez-Rueda,
B2-O4 Davide Bartesaghi, Ferdinand Grozema, Tom Savenije
Bandgap Tunability and Charge Transport Properties of Mixed Antimony-Bismuth Cs₂AgBi_{1-x}SbxBr₆ Halide Double Perovskites
- 17:00 - 17:15 Nakita K. Noel (*Princeton University*)
B2-O5 Interfacial Charge-transfer Doping of Metal Halide Perovskites for High Performance Optoelectronics
- 17:15 - 17:30 Jongchul Lim (*University of Oxford, GB*), Bernard Wenger, Henry Snaith
B2-O6 Elucidating the Long-range Charge Carrier Mobility in Metal Halide Perovskite Thin Films

Session C2



- 14:30 - 14:45 **C2-05** Nishat Sultana (*Department of Physics, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand*), Nicholas J. Demarais, Denys Shevchenko
Unveiling the Degradation mechanism of Perovskite Solar Cells by the Laser Desorption/Ionization Mass Spectrometry
- 14:45 - 15:00 **C2-06** Bowon Yoo (*Department of Chemistry and Centre for Plastic Electronics, Imperial College London*), Alex Aziz, Dibyajyoti Ghosh, Hyejin Park, M. Saiful Islam, Saif A. Haque
Optical and Electronic Property Changes in Lead-free Perovskites by Metal Cation Transmutation
- 15:00 - 15:30 **C2-IS2** Azat Akbulatov, Olga Yamilova, Mohamed Elnaggar, Alexandra Boldyreva, Moneim Elshobaki, Sergey Tsarev, Lyubov Frolova, Keith Stevenson, Pavel Troshin (*Skolkovo Institute of Science and Technology, Skolkovo Innovation Center*)
Revealing Diverse Degradation Pathways in Lead Halide Perovskite Solar Cells
- 15:30 - 15:45 **C2-O1** Kohei Nishimura, Daisuke Hirotoni, Gaurav Kapil, Chi Huey Ng, Kengo Hamada, Kamarudin, Muhammad Akmal, Ripolles Teresa, Shen Qing, Satoshi Iikubo, Takashi Minemoto, Kenji Yoshino, Hiroshi Segawa, Shuzi Hayase (*Kyushu Institute of Technology*)
Relationship between Relative Lattice Strain and Efficiency for Sn-Perovskite Solar Cells
- 15:45 - 16:00 **C2-O2** Lucija Rakocevic (*IMEC, Leuven*), Felix Ernst, Robert Gehlhaar, Tom Aernouts, Christoph Brabec, Jef Poortmans
Reliable comparison of perovskite solar cell performance using maximum power point tracking
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 17:00 **C2-IS1** Joseph Cardon, Kevin Tkaczibson, Hsiang-Yun Chen, Shane Ardo (*Department of Chemistry, University of California, Irvine, CA 92617 USA*)
Leveraging Iodide Oxidation Electrocatalysts to Overcome Efficiency Limitations in Dye-Sensitized Solar Cells
- 17:00 - 17:15 **C2-O3** Francesca Tessore (*Dipartimento di Chimica, Università degli Studi di Milano*), Gabriele Di Carlo, Alessio Orbelli, Birol, Elisabetta Benazzi, Stefano Caramori
HIGH-POTENTIAL PORPHYRIN-BASED SnO₂ PHOTOANODES for WATER PHOTOOXIDATION
- 17:15 - 17:30 **C2-O4** Ingrid Rodríguez-Gutiérrez, Manuel Rodríguez-Pérez, Alberto Vega-Poot, Geonel Rodríguez-Gattorno, Gerko Oskam (*Department of Applied Physics, CINVESTAV-IPN, Mérida, Yuc., México.*)
Photoelectrochemistry of Semiconducting Oxide Materials for Solar Water Splitting: Characterization of Charge Carrier Dynamics Using IMPS

19:30 - 22:00 **Social Dinner**

May 15th - Day 4 (Wednesday)

08:45 - 09:00 **Poster prize ceremony**

Session G3.1

- 09:00 - 09:45 **G3.1-K1** Xiaoyang Zhu (*Department of Chemistry, Columbia University, New York, New York 10027, United States*)
Ferroelectric large polarons in lead halide perovskites
- 09:45 - 10:15 **G3.1-I1** Oleg Prezhdo (*Chemistry, University of Southern California*)
Time-Domain Modeling of Excited State Dynamics in Halide Perovskites
- 10:15 - 10:45 **G3.1-I2** Lin Chen (*Chemical Sciences and Engineering Division, Argonne National Laboratory, Lemont, Illinois 60439, United States*)
Electronic Processes, Morphologies and Structural-functional Correlations in Conjugated Oligomers and Polymers for OPV and Photocatalysis

10:45 - 11:15 **Coffee Break**

Session G3.2

- 11:15 - 11:45 **G3.2-I1** Anders Hagfeldt (*Laboratory of Photomolecular Science (LSPM), Institute of Chemical Sciences and Engineering, School of Basic Sciences, Ecole Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland.*)
The Versatility of Mesoscopic Solar Cells



11:45 - 12:15 G3.2-I2	<u>Efrat Lifshitz</u> (<i>Schulich Faculty of Chemistry, Russell Berrie Nanotechnology Institute, Solid State Institute, Technion-Israel Institute of Technology</i>) Magnetic Interactions in Pristine and Magnetically Doped Halide-Perovskites
12:15 - 12:45 G3.2-I3	<u>Samuel Stranks</u> (<i>Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK.</i>) Visualising the Impact of Defects and Strain on Halide Perovskite Structures
12:45 - 13:00	Industry talk
13:00 - 14:30	Lunch Break
Session A3	
14:30 - 15:00 A3-IS1	<u>Bruno Ehrler</u> (<i>Center for Nanophotonics, AMOLF, Science Park 104, 1098 XG Amsterdam, The Netherlands</i>), Moritz Futscher, Lucie McGovern The Path towards Efficient and Stable Perovskite/Silicon Tandem Solar Cells
15:00 - 15:15 A3-O3	<u>Ihtezaz Muhaimen Hossain</u> (<i>Institute of Microstructure Technology, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany</i>), Yidenekachew Donie, Raphael Schmager, Mohamed S. Abdelkhalik, Andrei Karabanov, Somayeh Moghadamzadeh, Jonas A. Schwenzler, Uli Lemmer, Bryce S. Richards, Guillaume Gomard, Ulrich W. Paetzold Nanophotonic front electrodes for perovskite-based tandem photovoltaics
15:15 - 15:30 A3-O4	Alexander J. Bett, Patricia S.C. Schulze, <u>Kristina M. Winkler</u> (<i>Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, 79110 Freiburg, Germany</i>), Özde Kabakli, Martin Bivour, Ludmila Cojocar, Ines Ketterer, Laura E. Mundt, Leonard Tutsch, Martin Hermle, Stefan W. Glunz, Jan Christoph Goldschmidt Monolithic perovskite silicon tandem solar cells with high-bandgap perovskite absorber exceeding 1.8 V open-circuit voltage
15:30 - 15:45 A3-O5	<u>Ricardo Razer</u> (<i>École Polytechnique Fédérale de Lausanne EPFL, CH</i>), Peter Fiala, Fan Fu, Florent Sahl, Terry Yang, Matthias Bräuninger, Henri Boudinov, Quentin Jeangros, Christophe Ballif Stability of perovskite and two terminal Si/perovskite tandem solar cells under reverse bias
15:45 - 16:00 A3-O6	<u>Rebecca Belisle</u> (<i>Department of Physics, Wellesley College</i>), James Raiford, Kevin Bush, Luca Bertoluzzi, Aryeh Gold-Parker, Axel Palmstrom, Rohit Prasanna, Michael Toney, Stacey Bent, Michael McGehee Designing Contact Layers and Surface Treatments to Overcome Performance Challenges for Perovskite Tandems
16:00 - 16:30	Coffee Break
16:30 - 16:45 A3-O1	<u>Marko Jost</u> (<i>Young Investigator Group Perovskite Tandem Solar Cells, Helmholtz-Zentrum Berlin</i>), Tobias Bertram, Dibyashree Koushik, Jose A. Marquez, Marcel A. Verheijen, Eike Köhnen, Amran Al-Ashouri, Thomas Unold, Mariadriana Creatore, Iver Lauer, Christian A. Kaufmann, Rutger Schlatmann, Steve Albrecht Thin Conformal Hole Transport Layers Enabling Highly Efficient Monolithic Perovskite/CIGSe Tandem Solar Cells
16:45 - 17:00 A3-O2	<u>Yangying Zhou</u> (<i>State Key Laboratory of New Ceramics & Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, P. R. China.</i>), Hong Lin Perovskite Solar Cell-Thermoelectric Tandem System with a High Efficiency of Over 23%
17:00 - 17:15 A3-O7	<u>Heping Shen</u> (<i>Research School of Engineering, The Australian National University</i>), Stefan Omelchenko, Daniel Jacobs, Sisir Yalamanchili, Nathan Lewis, Kylie Catchpole In situ recombination junction between p-Si and TiO ₂ enables high-efficiency monolithic perovskite/Si tandem cells
Session B3	
14:30 - 14:45 B3-O7	Tae-Woong Kim, Ludmila Cojocar, <u>Satoshi Uchida</u> (<i>Research Center for Advanced Science and Technology (RCAST), The University of Tokyo</i>), Tomonori Matsushita, Takashi Kondo, Hiroshi Segawa High Resolution TEM Observation of MAPbI ₃ Perovskite Solar cells with Superlattice
14:45 - 15:00 B3-O8	<u>Eva M. Barea</u> (<i>Institute of Advanced Materials (INAM), Universitat Jaume I</i>), Jesús Rodríguez-Romero, Bruno Clasen Hames, Iván Mora-Seró Conjugated Organic Cations to Improve the Optoelectronic Properties of 2D/3D Perovskites



- 15:00 - 15:15 alessandra alberti (*Institute for Microelectronics and Microsystems (CNR-IMM), Zona Industriale - VIII Strada 5, Catania 95121, Italy*), ioannis deretzis, giovanni mannino, emanuele smecca, filippo giannazzo, andrea listorti, silvia colella, sofia masi, antonino la magna
B3-O5 Nitrogen soaking promotes lattice recovery in polycrystalline hybrid perovskites
- 15:15 - 15:30 Alessio Gagliardi (*Technische Universität München*), Jared Stanley
B3-O6 Novel machine learning method for stability and energy bandgap prediction of lead free perovskite materials
- 15:30 - 16:00 Lioz Etgar (*Institute of Chemistry, Hebrew University of Jerusalem*)
B3-IS1 Low Dimensional Perovskite: Stability, Solar Cells and Nanostructures
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 Andrés Burgos-Camina (*Photochemical Dynamics Group, Institute of Chemical Sciences and Engineering, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*), Aurélien Willauer, Ahmad Ajdar Zadeh, Jacques-E. Moser
B3-O1 Hot Carrier Dynamics in Lead Halide Perovskites: Mobility and Carrier-Phonon Coupling
- 16:45 - 17:00 Sandy Sanchez (*École Polytechnique Fédérale de Lausanne EPFL, CH*)
B3-O2 Flash infrared annealing method: the pulse time to control the perovskite crystal nucleation and growth from solution
- 17:00 - 17:15 Paramvir Ahlawat (*Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland*), Michele Parrinello, Ursula Rothlisberger
B3-O3 Atomistic Simulations of Nucleation of Lead Halide Perovskites
- 17:15 - 17:30 Kelly Schutt (*University of Oxford, GB*), Pabitra Nayak, Alexandra Ramadan, Bernard Wenger, Yen-Hung Lin, Henry Snaith
B3-O4 Overcoming Zinc Oxide Interface Instability with Methylammonium-free Perovskites for High Performance Solar Cells

Session C3

- 14:30 - 14:45 Dominik Kubicki (*Institute of Chemical Sciences and Engineering, Ecole Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland*), Daniel Prochowicz, Albert Hofstetter, Shaik Zakeeruddin, Michael Grätzel, Lyndon Emsley
C3-O5 Cadmium Doping: Incorporation and Phase Segregation in Mixed-Cation and Mixed-Halide Lead Perovskites from Solid-State NMR
- 14:45 - 15:00 Stuart Macpherson (*Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK.*), Andrew Winchester, Elizabeth Tennyson, Krzysztof Galkowski, Tiarnan Doherty, Miguel Anaya, Christopher Petoukhoff, Michael Man, Keshav Dani, Samuel Stranks
C3-O6 Modulating Nanoscale Defect States in Halide Perovskite Films
- 15:00 - 15:30 Udo Bach (*ARC Centre of Excellence in Exciton Science, Department of Chemical Engineering, Monash University, Clayton, VIC, Australia*), Wenxin Mao
C3-IS2 Towards Single-Crystalline Perovskite Devices
- 15:30 - 15:45 Mathias Uller Rothmann (*Department of Physics, University of Oxford*), Judy Kim, Juliane Borchert, Kilian Lohmann, Colum O'Leary, Alex Shearer, Michael Johnston, Henry Snaith, Peter Nellist, Laura Herz
C3-O3 Reliable Atomic-Resolution Observations of the Nanoscopic Properties of Hybrid Perovskite Thin Films
- 15:45 - 16:00 Gergely Samu (*Department of Physical Chemistry and Materials Science, Interdisciplinary Excellence Centre, University of Szeged*), R.A. Scheidt, A. Balog, C. Janáky, P.V. Kamat
C3-O4 Modulation of Excited State Dynamics in Lead Halide Perovskite Films with Electrical Bias
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 17:00 Tanja Ivanovska (*Saule Technologies*)
C3-IS1 Step by Step toward Commercially Available Flexible Perovskite Modules
- 17:00 - 17:15 David McMeekin (*Clarendon Laboratory, Department of Physics, Oxford University, Oxford OX1 3PU, UK*), Suhas Mahesh, Nakita Noel, Matthew Klug, JongChul Lim, Jonathan Warby, James Ball, Laura Herz, Michael Johnston, Henry Snaith
C3-O2 Solution-Processed All-Perovskite Multi-Junction Solar Cells



17:15 - 17:30 **Claire Burgess** (*Department of Applied Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands*), Farzad Mardekatani Asl, Valerio Zardetto, Herbert Lifka, Sjoerd Veenstra, Mariadriana Creatore
Interface Studies of Metal Oxides Grown Directly on Hybrid Perovskite by Atomic Layer Deposition

Poster Contribution

- | | |
|-----|--|
| 001 | Priya Shrivastava (<i>Centre for Research in Nanotechnology and Science, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India</i>), K.R. Balasubramaniam, Parag Bhargava
Morphological and Electronic Tailoring: Insights into Zero Dimensional Bismuth Based (CH ₃ NH ₃) ₃ Bi ₂ I ₉ Lead Free Perovskites |
| 002 | Hooman Mehdizadeh Rad (<i>Charles Darwin University</i>), Jai Singh
Study of Diffusion Length of Charge Carriers in Perovskite Solar Cells |
| 004 | Loreta Angela Muscarella (<i>AMOLF Institute</i>), Sandy Sanchez, Andries Lof, Michael Saliba, Bruno Ehrler
Impact of Flash Infrared Annealing on Growth and Photophysics of MAPbI ₃ Perovskite |
| 005 | Loreta Angela Muscarella (<i>AMOLF Institute</i>), Eline M. Hutter, Jan Versluis, Huib Bakker, Bruno Ehrler
Carrier cooling in Perovskite under Hydrostatic Pressure Probed by Transient Absorption Spectroscopy |
| 007 | BongSoo Kim (<i>Ulsan National Institute of Science and Technology (UNIST), KR</i>)
Structure-to-photovoltaic property relationships in rhodanine-based small molecule acceptors |
| 008 | Jovana Milic (<i>Laboratory of Photonics and Interfaces, Institute of Chemical Sciences and Engineering, École Polytechnique Fédérale de Lausanne, Lausanne CH-1015, Switzerland</i>), Dominik Kubicki, Dongqin Bi, Xiong Li, Lyndon Emsley, Michael Graetzel
Multifunctional Molecular Modulation for Stable and Efficient Hybrid Perovskite Solar Cells |
| 012 | Silvia Motti (<i>Department of Physics, University of Oxford</i>), Timothy Crothers, Rong Yang, Jianpu Wang, Laura Herz
Energy Cascades in Mixed-Phase Perovskite Thin Films: Charge-Carrier Dynamics and Mobilities |
| 018 | Dengyang Guo (<i>Department of Chemical Engineering, Delft University of Technology, 2629 HZ Delft, The Netherlands.</i>), Valentina Caselli, Eline Hutter, Tom Savenije
Predicting the Maximum Open Circuit Voltage of Perovskite Solar Cells from Time-Resolved Measurements |
| 021 | Lucie McGovern (<i>Center for Nanophotonics, AMOLF, Science Park 104, 1098 XG Amsterdam, The Netherlands</i>), Loreta Muscarella, Moritz Futscher, Bruno Ehrler
Quantification of Ion Migration in MAPbBr ₃ Solar Cells with varying Grain Size |
| 022 | Nick Vlachopoulos (<i>Laboratory of Photomolecular Science, Institute of Chemical Sciences and Engineering, École Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland</i>), Anders Hagfeldt, Michael Grätzel
Electrochemical Methods in Dye-Sensitized and Perovskite Solar Cell Research |
| 024 | Cheng-Hung Hou (<i>Academia Sinica</i>), Jing-Jong Shyue, Shu-Han Hung, Li-Ji Jhang
Artifact-Free Depth Profiles Acquired by ToF-SIMS and Their Utility in Revealing Perovskite Solar Cells' Natures |
| 026 | Andrea Rubino (<i>Instituto de Ciencia de Materiales de Sevilla (ICMS-CSIC)</i>), Mauricio Calvo, Juan Galisteo, Hernán Míguez
APbX ₃ Perovskite Nanocrystals in Porous Matrices: Size Control and New Potential Applications |
| 027 | Ajay Singh (<i>Department of Electrical and Computer Engineering, Technical University of Munich</i>), Alessio Gagliardi
Drift-diffusion and Machine Learning for High Efficiency Perovskite-Perovskite based Tandem Solar Cells |
| 028 | YOUNGU LEE (<i>Daegu Gyeongbuk Institute of Science and Technology</i>)
Regioregular Terpolymers for High-Performance Organic Photovoltaic Devices |
| 042 | Sameh Hamzawy (<i>Intelligent Polymer Research Institute, University of Wollongong</i>), Pawel Wagner, Attila Mozer, Andrew Nattestad
Redox Mediators Effect on The Up-Convesion System Performance for Intermediate Band Dye Solar Cells Applications |



- 047 Isabella Poli (*Dept. of Chemistry & Centre for Sustainable Chemical Technologies, University of Bath, Claverton Down, Bath BA2 7AY, UK*), Ulrich Hintermair, Miriam Regue, Santosh Kumar, Emma Sackville, Jenny Baker, Trystan Watson, Salvador Eslava, Petra Cameron
Inexpensive Metal Free Encapsulation Layers Enable Halide Perovskite Based Photoanodes for Water Splitting
- 053 Seyedali Emami (*LEPABE, Departamento de Engenharia Química, Universidade do Porto – Faculdade de Engenharia, Rua Dr. Roberto Frias s/n 4200-465 Porto, Portugal*), Dzmitry Ivanou, Adélio Mendes
LASER-ASSISTED GLASS FRIT ENCAPSULATION of HTM-FREE PEROVSKITE SOLAR CELLS
- 056 Leonardo Buizza (*Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, United Kingdom*), Zhiping Wang, Timothy Crothers, Rebecca Milot, Henry Snaith, Michael Johnston, Laura Herz
Charge-Carrier Dynamics, Mobilities and Diffusion Lengths of 2D-3D Lead Halide Perovskites
- 057 Inseong Cho (*Intelligent Polymer Research Institute, University of Wollongong*), Peter Innis, Attila Mozer
Exploiting intermolecular interaction between alkyl-functionalised electron donor-acceptor pairs as a strategy to enhance electron transfer kinetics
- 060 Hsin-Hsiang Huang (*Department of Materials Science and Engineering, National Taiwan University, Taipei 10617, Taiwan.*), Leeyih Wang, King-Fu Lin
High-Performance and Robust CH₃NH₃PbI₃/Nanoclay Hybrid Perovskite Solar Cells Under High-Humidity Condition
- 064 Karen Valadez-Villalobos, Alejandra Castro-Chong, Gerko Oskam (*1 Department of Applied Physics, CINVESTAV-IPN, Mérida, Yuc. 97310, México*), Tom Aernouts, Juan A. Anta
Effect of the Electron Selective Contact Material on the performance and Stability of Hybrid Perovskite Solar Cells
- 065 Chuantian Zuo (*CSIRO Manufacturing*), Andrew D. Scully, Doojin Vak, Wenliang Tan, Xuechen Jiao, Christopher R. McNeill, Dechan Angmo, Liming Ding, Mei Gao
Self-Assembled Two-Dimensional Perovskites Layers for Efficient Printable Solar Cells
- 066 O-Pil Kwon (*Department of Molecular Science and Technology, Ajou University, Suwon 443-749 (Korea)*), Su-Kyo Jung, Jong-Bum Lee, Dae Woon Lee, Mojca Jazbinsek, Jong H. Kim
Organic Electron Transporting Materials with Naphthalene Diimide Semiconducting Core and Their THz Spectroscopy
- 067 Diego Di Girolamo (*CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata*), Aldo Di Carlo, Danilo Dini, Antonio Abate
Recombination and Electrical Stability. What Happens at the HSL/Perovskite Interface and How to Solve it
- 069 Meiqian Tai (*State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China*), Xingyue Zhao, Hong Lin
Flash-evaporation Printing Methodology for Perovskite Thin Films and Efficient Solar Cells
- 070 Alexander Polyakov (*Department of Semiconductor Electronics and Device Physics, National University of Science and Technology MISiS*), Nickolay Smirnov, Ivan Shchemerov Shchemerov, Danila Saranin, Anna Pozniak, Ali Sehpar Shikoh, Sergey Didenko, Denis Kuznetsov, Antonio Agresti, Sara Pescetelli, Fabio Matteocci, Aldo Di Carlo
Admittance spectroscopy and DLTS measurements on multication mesoscopic perovskite solar cells
- 071 Cristina Teixeira (*FEUP - Faculdade de Engenharia da Universidade do Porto, University of Porto*), Luísa Andrade, Adélio Mendes
Preparation of carbon-based electrodes to be used as back-contact in perovskite solar cells
- 073 Jay Patel (*Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, United Kingdom*), Qianqian Lin, Olga Zadvorna, Christopher Davies, Laura Herz, Michael Johnston
Utilizing Temperature-Dependent Photocurrent Spectroscopy to Extract the Exciton Binding Energy of CH₃NH₃PbI₃ Perovskite Thin-Films
- 079 Eike Köhnen (*Helmholtz-Zentrum Berlin für Materialien und Energie, Institut für Si-Photovoltaik*), Marko Jošt, Anna Belen Morales-Vilches, Philipp Tockhorn, Amran Al-Ashouri, Bart Macco, Lukas Kegelmann, Lars Korte, Bernd Stannowski, Bernd Rech, Rutger Schlatmann, Steve Albrecht
Highly Efficient Monolithic Perovskite Silicon Tandem Solar Cells: Analysing Current-Mismatch Conditions
- 080 Askhat Jumabekov (*Department of Physics, School of Science and Technology, Nazarbayev University, Astana 010000, Kazakhstan*), Giovanni DeLuca, Yinghong Hu, Gede Adhyaksa
Transparent Quasi-Interdigitated Electrodes for Semitransparent Perovskite Back-Contact Solar Cells



- 081 Ludmila Cojocaru, Karl Wienands (*Freiburg Center for Interactive Materials and Bioinspired Technologies (FIT), Laboratory for Photovoltaic Energy Conversion, Institute for Sustainable Systems Engineering (INATECH), University of Freiburg, Germany*), Matthias Breitwieser, Alexander J. Bett, Patricia S. C. Schulze, Jan Christoph Goldschmidt, Stefan W. Glunz
Evaporation-based techniques for high quality absorbers (Pb and Pb-free) prepared on structured substrates
- 082 Isabel Mesquita (*LEPABE - Laboratory for Process Engineering, Environment, Biotechnology and Energy, Faculty of Engineering, University of Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal*), Luísa Andrade, Adélio Mendes
Impact of Environmental Conditions in Perovskite Solar Cells: Relative Humidity and Oxygen
- 085 Blaise Godefroid (*Université libre de Bruxelles*), Gregory Kozyreff
Optimisation of Metallic Interconnecting Layer in Homo-Tandem Cells
- 089 Giuliana Giuliano (*Dipartimento di Fisica e Chimica (DiFC), Università degli Studi di Palermo, Viale delle Scienze, Ed. 17-18, 90128 Palermo, Italy*), Sebastiano Cataldo, Michelangelo Scopelliti, Tiziana Fiore, Bruno Pignataro
Multilayer Copper-Rich Transparent Electrode as an Alternative Top Anode for High-Performance Semitransparent Perovskite Solar Cells
- 092 Chi-Yuan Chang (*Center for Condensed Matter Sciences, National Taiwan University, Taipei 10617, Taiwan.*), Leeyih Wang, Yang-Fang Chen, Fang-Chi Hsu
Perovskite Solar Cells Based on Self-assembled Hole-Extraction Monolayer with Conjugated Polyelectrolyte
- 097 Wolfgang Köntges (*Centre for Advanced Materials (CAM), Heidelberg University, Heidelberg, Germany*), Pavlo Perkhun, Rasmus R. Schröder, Riva Alkarsifi, Olivier Margeat, Christine Vidélot-Ackermann, Jörg Ackermann, Martin Pfanmüller
Real-Space Correlation of Crystallinity and Material Phase Distribution in Non-Fullerene Acceptor Blends
- 098 Rúben Madureira (*LEPABE - Laboratory for Process Engineering, Environment, Biotechnology and Energy, Faculty of Engineering, University of Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal*), Jorge Martins, Seyedali Emami, Joaquim Mendes, Adélio Mendes
Hermetic Sealing of Perovskite Solar Cells at Process Temperature Lower than 85 °C
- 103 Vsevolod Mazov (*LASE-Laboratory for Advanced Solar Energy, National University of Science and Technology MISiS*), Pavel Gostishchev, Saranin Danila, Denis Kuznetsov, Aldo Di Carlo
Increase of halide perovskite stability with piperidine derivatives in 2D/3D structures
- 104 Emanuele Smecca, Ajay Jena, Ioannis Deretzis, Gyu Min Kim, Yohuei Numata, Silvia Scalese, Giovanni Mannino, Corrado Bongiorno, Antonino La Magna, Tsutomu Miyasaka, Alessandra Alberti (*CNR-IMM, Istituto per la Microelettronica e Microsistemi*)
Fully solvent-free preparation of MAPbI₃ films for photovoltaic application
- 106 Natalie Mica (*Organic Semiconductor Centre, SUPA, School of Physics and Astronomy, St Andrews, Fife, KY16 9SS, UK*), Stuart Thomson, Ifor Samuel
Mobility of Non-fullerene Acceptors Using a Time of Flight Method
- 110 Lukas Kegelmann (*Young Investigator Group Perovskite Tandem Solar Cells, Helmholtz-Zentrum Berlin*), Philipp Tockhorn, Max Grischek, José A. Márquez, Thomas Unold, Wilfried Lövenich, Dieter Neher, Steve Albrecht
SpiDOT: mixtures of undoped Spiro-OMeTAD and PEDOT to reduce charge recombination and absorption losses in monolithic perovskite/silicon tandem solar cells
- 113 Yuriy Karpov, Danila Saranin (*LASE-Laboratory for Advanced Solar Energy, National University of Science and Technology MISiS*), Lev Luchnikov, Vsevolod Mazov, Inga Ermanova, Pavel Gostischev, Sergey Didenko, Denis Kuznetsov, Aldo Di Carlo
High-performing, hysteresis-free perovskite solar cells with inverted structure for indoor application
- 114 Jhon Puerres-Puerres (*Chemistry Department, Universidad de los Andes*), Pablo Ortiz-Herrera, María T. Cortés M.
Photoelectrochemical Hydrogen Production Using Thin Films of Polypyrrole Electrochemically Synthesized
- 116 Pavao Andričević (*Laboratory of Physics of Complex Matter (LPMC), Ecole Polytechnique Fédérale de Lausanne, Centre Est, Station 3, CH-1015 Lausanne, Switzerland*), Pavel Frajtag, Vincent Pierre Lamirand, Andreas Pautz, Márton Kollár, Bálint Náfrádi, Andrzej Sienkiewicz, Tonko Garma, László Forró, Endre Horváth
100 Hours Operation of Large Perovskite Single Crystals for Gamma Dose-rate Measurements



- 118 Pavlo Perkhun (*Aix-Marseille Univ., UMR CNRS 7325, Centre Interdisciplinaire de Nanosciences de Marseille (CINaM), 13009 Marseille Cedex 09, France*), Elena Barulina, Sadok Ben Dkhil, Pascal Pierron, Wolfgang Köntges, Martin Pfannmöller, Christine Videlot-Ackermann, Olivier Margeat, Jean-Jacques Simon, Jörg Ackermann
Digital printing of polymer solar cells based on non-fullerene acceptors: from spin coating to digital printing
- 126 Fabian Schackmar (*Karlsruhe Institute of Technology (KIT), Light Technology Institute (LTI), Engesserstrasse 13, 76131 Karlsruhe, Germany*), Helge Eggers, Tobias Abzieher, Gerardo Hernandez-Sosa, Bryce S. Richards, Uli Lemmer, Ulrich W. Paetzold
Inkjet-Printed Micron-Thick Triple-Cation Absorber Layers with Columnar Crystals in Perovskite Solar Cells Exceeding 18% Stabilized Power Conversion Efficiency
- 127 Dmitry Baranov (*Istituto Italiano di Tecnologia (IIT)*), Stefano Toso, Liberato Manna
Cesium Lead Bromide Nanocrystal Superlattices: from Optical Properties to Applications
- 130 Naveen Venkatesan (*Materials, University of California Santa Barbara*), John Labram, Rhys Kennard, Ryan DeCrescent, Hidenori Nakayama, Clayton Dahlman, Erin Perry, Jon Schuller, Michael Chabiny
Charge Carrier Dynamics and Structural Defects in Layered Hybrid Perovskites
- 133 Nga Phung (*Helmholtz-Zentrum Berlin*), Aboma Merdasa, Antonio Abate
Real-time observation of ion migration interaction with grain boundaries in methylammonium lead iodide by photoluminescence imaging
- 134 Diego De Girolamo, Ibrahim M. Dar, Danilo Dini, Lorenzo Gontrani, Ruggero Caminiti, Alessandro Mattoni, Michael Graetzel, Simone Meloni (*Dept. of Mechanical and Aerospace Engineering, Sapienza University of Rome, via Eudossiana 18, 00184, Rome, Italy*)
Dual Effect of Positive and detrimental effects of humidity on cesium lead bromide
- 135 Davide Moia (*Department of Physics, Imperial College London, UK*), Ilario Gelmetti, Phil Calado, William Fisher, Michael Stringer, Onkar Game, Yinghong Hu, Pablo Docampo, David Lidzey, Emilio Palomares, Joachim Maier, Jenny Nelson, Piers Barnes
The device physics of metal halide perovskite interfaces, part 2: equivalent circuit model
- 137 Simon Ternes (*Light Technology Institute, Karlsruhe Institute of Technology, Engesserstr. 13, 76131 Karlsruhe, Germany*), Tobias Börnhorst, Jonas A. Schwenzler, Ihtezaz M. Hossain, Waldemar Mehlmann, Philip Scharfer, Wilhelm Schabel, Uli Lemmer, Bryce S. Richards, Ulrich W. Paetzold
In-situ analysis of the drying process in blade-coated perovskite absorber layers for efficient solar cells
- 138 David O. Tiede (*Instituto de Ciencia de Materiales de Sevilla (ICMS-CSIC)*), Juan F. Galisteo-López, Maurico E. Calvo, Hernán Míguez
Improving the Bulk Emission Properties of CH₃NH₃PbBr₃ by Modifying the Halide-Related Defect Structure
- 142 Gregor Trimme (*Institute for Chemistry and Technology of Materials (ICTM), NAWI Graz, Graz University of Technology*), Thomas Rath, Stefan Weber, Jasmin Handl, Theodoros Dimopoulos, Birgit Kunert
Investigation of Triple Cation Tin Perovskite Solar Cells
- 143 TAUHEED MOHAMMAD (*Photovoltaic Laboratory, Centre for Energy Studies, Indian Institute of Technology Delhi New Delhi-110016, India*), Viresh Dutta, Mahesh Kumar, Suresh Chand
Spray Deposition Technique for Utilizing Förster Energy Transfer in Bulk Heterojunction Organic Solar Cells: Role of Applied Voltage
- 144 Tetsuhiko Miyadera (*Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*), Yuto Auchi, Kohei Yamamoto, Noboru Ohashi, Tomoyuki Koganezawa, Yuji Yoshida, Masayuki Chikamatsu
Real-Time Crystallization Analysis of Organolead-Halide Perovskite
- 145 Christof Schultz, Andreas Bartelt (*University of Applied Sciences – HTW Berlin*), Antje Neubauer, Cornelia Junghans, Marko Jost, Lukas Kegelmann, Rutger Schlatmann, Steve Albrecht, Bert Stegemann
Time-resolved photoluminescence imaging reveals material modifications of laser scribes in perovskite solar cells



- 146 Stefania Cacovich (*IPVF, Institut Photovoltaïque d'Île-de-France, 30 RD 128, 91120 Palaiseau, France*), Adrien Bercegol, Daniel Ory, Daniel Suchet, Olivier Fournier, Jean-François Guillemoles, Jean Rousset, Laurent Lombez
Quantitative Assessment of Photonic and Electronic Properties in Multi-Cation Halide Perovskites through Multi-Dimensional Luminescence Imaging
- 147 Allan Starkholm (*RISE Surface, Process and Formulation, Forskargatan 20J, 15136 Södertälje, Sweden*), Per H Svensson, Lars Kloo
Approaches for Performance Improvement of Low-Dimensional Perovskite Systems as Photovoltaic Materials
- 149 Richard Ciesielski (*Department of Chemistry and Center for NanoScience (CeNS), LMU Munich, 80539 Munich, Germany*), Alexander Biewald, Frank Schäfer, Pablo Docampo, Achim Hartschuh
Temperature Dependent Charge Carrier Diffusion and the Role of Grain Boundaries in Thin Film Perovskites
- 152 Artiom Magomedov (*Department of Organic Chemistry, Kaunas University of Technology*), Amran Al-Ashouri, Ernestas Kasparavicius, Gediminas Niaura, Tadas Malinauskas, Steve Albrecht, Vytautas Getautis
Hole-Selective Monolayers: Synthesis, Deposition, and Application in Efficient Perovskite Solar Cells.
- 156 Ahmed Said (*School of Materials Science and Engineering, Nanyang Technological University*), Qichun Zhang, Dada Shaikh, Sidhanath Bhosale, Yang Wang, Tsuyoshi Michinobu
Organic Non-Fullerene Acceptors as Efficient Electron Transporting Materials in Inverted Perovskite Solar Cells
- 157 Arup Mahata (*D3-CompuNet, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy*), Daniele Meggiolaro, Filippo De Angelis
Rationalizing Polaron Formation in 3D ABX₃ [A=FA, MA, Cs, Cs+MA; B=Pb, Sn, Pb+Sn; X=I, Br] Perovskites
- 158 Ula Yasin (*Berlin Joint EPR Lab, Freie Universität Berlin, Berlin (Germany)*), Lukas Kegelman, Felix Kraffert, Steve Albrecht, Jan Behrends
Quantitative EPR Analysis of Doped Spiro-OMeTAD
- 159 Damiano Ricciarelli (*Computational Laboratory for Hybrid/Organic Photovoltaic (CLHYO), Istituto CNR di Scienze e Tecnologie Molecolari (ISTM-CNR), Via Elce di Sotto 8, 06123 Perugia, Italy*), Daniele Meggiolaro, Filippo De Angelis
Computational Modelling of Defect Chemistry of Tin Halide Perovskites for Solar Cells Applications
- 160 Giulia Lucarelli (*CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata*), Sergio Castro-Hermosa, Michiel Top, Matthias Fahland, John Falteich, Thomas M. Brown
Ultra-Thin Flexible Glass Perovskite Solar Cells as Outstanding Photovoltaic Light Harvesters Under Indoor Illumination
- 167 Paolo Mariani (*Department of Electronics Engineering, University of Rome "Tor Vergata", via del Politecnico 1 00133 Rome - ITALY / CHOSE- Centre for Hybrid and Organic Solar Energy*), Babak Taheri, Maryam Esmailzadeh, Sara Pescetelli, Antonio Agresti, Aldo Di Carlo
Automatized Low Temperature Deposition of Blocking TiO₂ Layer for Large Area Perovskite Solar Devices
- 171 Amran Al-Ashouri (*Young Investigator Group Perovskite Tandem Solar Cells, Helmholtz-Zentrum Berlin*), Artiom Magomedov, Marcel Roß, Marko Jošt, Ganna Chistiakova, Eike Köhnen, Sergiu Levenco, José A. Márquez Prieto, Tadas Malinauskas, Charles J. Hages, Thomas Unold, Lars Korte, Bernd Rech, Vytautas Getautis, Steve Albrecht
Universal Self-Assembled Monolayer Contacts for >20% Efficient Perovskite Solar Cells
- 172 Maning Liu (*Faculty of Engineering and Natural Sciences, Tampere University, Tampere FI-33014, Finland*), Zhifeng Deng, Haichang Zhang, Paola Vivo
Dopant-free Hole-transporting Materials Via Thionation Approach Towards Stable and Efficient Perovskite Solar Cells
- 176 Eros Radicchi (*Department of Chemistry, Biology and Biotechnologies, University of Perugia & Computational Laboratory of Hybrid/Organic Photovoltaics (CLHYO), CNR - ISTM*), Edoardo Mosconi, Fausto Elisei, Francesca Nunzi, Filippo De Angelis
Understanding the Solution Chemistry of Lead Halide Perovskite Precursors
- 177 Eider A. Erazo Erazo (*Ph.D. student, Bogotá, Universidad de los Andes, 11711, Colombia*), Daniel Castillo-Bendeck, Pablo Ortiz, María T. Cortés
Electrodeposited PEDOT:DS-CIO₄ as a Promising Hole Transporting Material



- 180 Babak Taheri (*CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata*), Giorgio Cardone, Aldo Di Carlo, Francesca Brunetti
Automated Scalable Spray Coating of SnO₂ Colgel and SnO₂ Nano Particles for the Realization of Low Temperature and Large Area Perovskite Solar Cells
- 186 Zahra Andaji-Garmaroudi (*Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK.*), Mojtaba Abdi-Jalebi, Stuart Macpherson, Alan Bowman, Richard H. Friend, Samuel D. Stranks
Highly Stable Light Emitting Diodes via Potassium Passivation
- 190 Enzo Menna (*University of Padova, Department of Chemical Sciences*), Teresa Gatti
Chemical Modification of Carbon Nano Structures Leading to Hybrid Materials for Photovoltaics
- 192 Alessandro Senocrate (*Max Planck Institute for Solid State Research, Heisenbergstrasse 1, 70569, Stuttgart*), Igor Moudrakovski, Joachim Maier
Short-Range Methylammonium Dynamics in Methylammonium Lead Iodide
- 195 Dewalque Jennifer (*CESAM-GREENMAT, University of Liege, Allée du 6 Aout 13, Sart-Tilman, 4000 Liege, Belgium.*), Daem Nathan, Spronck Gilles, Schrijnemakers Audrey, Maho Anthony, Colson Pierre, Lobet Michael, Piron Pierre, Loicq Jérôme, Henrist Catherine, Cloots Rudi
Opal-like CH₃NH₃PbI₃ perovskite solar cells : effect of the 3D structuration on the conversion efficiency
- 197 Yun Li (*The Hong Kong Polytechnic University*), Wallace Woon-Fong Leung
Performance enhancement of perovskite solar cell with graphene nanofibers
- 198 Anna Pachariyangkun (*Department of Materials Science and Engineering, School of Molecular Science and Engineering, Vidyasirimedhi Institute of Science and Technology (VISTEC)*), Taweesak Sudyoadsuk, Vinich Promarak
Naphthothiadiazole Core Flanked with Furan and Thiophene as Small Molecule Donor for High Performance Solution-processed Bulk Heterojunction Solar Cells
- 199 Xingdong Ding (*Institute for Energy Research, Key Laboratory of Zhenjiang, Jiangsu University, Zhenjiang 212013, PR China*), Cheng Chen, Ming Cheng
Highly Efficient Phenothiazine 5, 5-Dioxide-Based Hole Transport Materials for Planar Perovskite Solar Cells with PCE Exceeding 20%
- 201 Shigehiko Mori (*Corporate Research & Development Center, Toshiba Corporation*), Haruhi Ohka, Hideyuki Nakao, Akio Amano, Kenji Todorii
Large Size (703 cm²) and Film Based Perovskite Photovoltaic Module Development with Inverted Device Structure
- 202 Ruttapol Malatong (*Department of Materials Science and Engineering, School of Molecular Science and Engineering, Vidyasirimedhi Institute of Science and Technology (VISTEC)*), Taweesak Sudyoadsuk, Vinich Promarak
A- π -D- π -A type small molecule donors for high performance bulk heterojunction organic photovoltaics
- 203 Anthony Maho (*CESAM-GREENMAT, University of Liege, Allée du 6 Aout 13, Sart-Tilman, 4000 Liege, Belgium.*), Jennifer Dewalque, Gilles Spronck, Audrey Schrijnemakers, Nathan Daem, Pierre Colson, Catherine Henrist, Rudi Cloots
Ultrasonic spray deposition of TiO₂ and other semiconducting layers for solar cells and light-driven optoelectronic devices
- 204 Wan Li (*Department of Materials Science and Engineering, School of Molecular Science and Engineering, Vidyasirimedhi Institute of Science and Technology, Wangchan, Rayong 21210, Thailand*), Praweena Wongkaew, Supawadee Namuangruk, Taweesak Sudyoadsuk, Vinich Promarak
Synthesis and properties of D- π -A- π -D type thiadiazole [3,4-c] pyridine-based small-molecule donors for organic photovoltaics
- 205 Hong Lin (*State Key Laboratory of New Ceramics & Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, P. R. China.*), Yu Zhou
Enhancing Electron Transport via Graphene Quantum Dot/Tin Oxide Composites for Efficient and Durable Flexible Perovskite Photovoltaics
- 206 Takayuki Shimizu (*AI SIN COSMOS R&D Co., Ltd., Kariya, Aichi 448-8650, Japan*), Mitsuhiro Adachi, Akira Suzuki, Rie Watanabe, Mareedu Sreenivasu, Devoju Harinada Chary, Satish Bykkam, Katsuya Tsuchimoto, Junji Nakajima, Toshiyuki Sano, Katsuyoshi Mizumoto
Effects of Modified Phthalocyanine as Hole-Transporting Materials in Perovskite Solar Cells



- | | |
|-----|--|
| 208 | <u>Mariia Karpacheva</u> (<i>University of Basel</i>), Catherine E. Housecroft, Edwin C. Constable
Electrolyte tuning in dye-sensitized solar cells with N-heterocyclic carbene iron(II) sensitizers |
| 210 | <u>Nathan Daem</u> (<i>GREENMAT - CESAM, University of Liege, Allée du 6 Aout 13, Sart-Tilman, 4000 Liege, Belgium.</i>), Jennifer Dewalque, Gilles Spronck, Pierre Colson, Catherine Henrist, Rudi Cloots
Lead-free double perovskite materials for photovoltaic application |
| 212 | <u>Sumita Boonnab</u> (<i>School of Chemistry, Institute of Science, Suranaree University of Technology, Muang District, Nakhon Ratchasima 30000, Thailand</i>), Thanaporn Manyum, Taweesak Sudyoadsuk, Vinich Promarak
D--A--D type small molecules with naphtho[2,3-c][1,2,5]thiadiazole as the central accepting core for organic photovoltaic |
| 213 | <u>Amalraj Peter Amalathas</u> (<i>Centre for Advanced Photovoltaics, Faculty of Electrical Engineering, Czech Technical University in Prague, Technická 2, 166 27 Prague, Czech Republic</i>), Lucie Landová, Brianna Conrad, Jakub Holovský
Alkali Lithium Metal Doping Effects on Mesoporous TiO ₂ Electron Transport Layer Based CH ₃ NH ₃ PbI ₃ Perovskite Solar Cells |
| 214 | <u>Bosky Sharma</u> (<i>Centre for Research in Nanotechnology and Science, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India</i>), Parag Bhargava, Dinesh Kabra
Enhanced performance of MAPbI ₃ based solar cell upon addition of p-type molecular dopant |