

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 - 18:30	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 Chair: Prashant Kamat Room: Aula Magna
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>Anders Hagfeldt</u> (<i>Laboratory of Photomolecular Science (LSPM), Institute of Chemical Sciences and Engineering, School of Basic Sciences, Ecole Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland.</i>) The Versatility of Mesoscopic Solar Cells
10:45 - 11:15	Coffee Break
	Session G1.2 Chair: Aleksandra Djurisić
11:15 - 11:45 G1.2-I1	<u>Lin Chen</u> (<i>Chemical Sciences and Engineering Division, Argonne National Laboratory, Lemont, Illinois 60439, United States</i>) Electronic Processes, Morphologies and Structural-functional Correlations in Conjugated Oligomers and Polymers for OPV and Photocatalysis
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 - 12:50 G1.2-S1	<u>Luca Sorbello</u> (<i>Great Cell Solar</i>) Hyperion a bright future for solar simulators: The Greatcell Solar Italia way
12:50 - 12:55 G1.2-S2	<u>Taro Tanabe</u> (<i>TCl</i>) TCl Industry talk
12:55 - 13:00 G1.2-S3	<u>Yanek Hebling</u> (<i>Greatcell Solar Materials Pty Ltd</i>) Innovative Materials for Innovative Technologies
13:00 - 14:30	Lunch Break

**Session A1**Chair: Shane Ardo
Room: Aula Minor

- 14:30 - 15:00
A1-IS1 Daniele Meggiolaro (*D3-CompuNet, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova*)
Defects Chemistry and Charge Traps in MA(Pb,Sn)I₃ Perovskites: A Computational Perspective
- 15:00 - 15:15
A1-O1 Silvia Motti (*Department of Physics, University of Oxford*), 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 Mohammad Sajedi Alvar (*Max Planck Institute for Polymer Research, Ackermannweg10, 55128 Mainz, Germany*), Gert Jan Wetzelaer, Paul Blom
Concentration and Mobility of Ions in Methylammonium Lead Iodide Thin Films from Dielectric Response
- 15:30 - 15:45
A1-O3 Alessandro Senocrate (*Max Planck Institut for Solid State Research*), Igor Moudrakovski, Tolga Acartuerk, Gee 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
A1-O4 Moritz Futscher (*Center for Nanophotonics, AMOLF, Science Park 104, 1098 XG Amsterdam, The Netherlands*), 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
A1-O5 Jinsong Huang, Charles Van Brackle (*University of North Carolina – Chapel Hill*)
Defect Passivation in Halide Perovskites
- 16:45 - 17:00
A1-O6 Waldemar Kaiser (*Department of Electrical and Computer Engineering, Technical University of Munich*), Nga Phung, Antonio Abate, Alessio Gagliardi
3D simulation of ion migration within the microstructure of perovskite solar cells
- 17:00 - 17:15
A1-O7 Gee Yeong Kim (*Max Planck Institute for Solid State Research, Physical Chemistry of Solid, Stuttgart, 70569, Germany*), Alessandro Senocrate, David Moia, Joachim Maier
Equilibrium space charges effect at halide perovskite interactions: The role of ionic charge carriers
- 17:15 - 17:30
A1-O8 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*), 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 B1Chair: Henk Bolink
Room: Aula 11

- 14:30 - 14:45
B1-O7 Ilker Dogan (*TNO Solliance*), 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
B1-O8 Felix Utama Kosasih (*Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, United Kingdom*), Lucija Rakocevic, Jef Poortmans, Caterina Ducati
Visualisation and Elemental Analysis of Perovskite Damage in Laser Scribing of Perovskite Solar Modules
- 15:00 - 15:15
B1-O1 Fabio Matteocci (*CHOSE - Centre for Hybrid and Organic Solar Energy, Department of Electronic Engineering, University of Rome Tor Vergata*), 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 B1-O2	<p><u>Florent Sahli</u> (<i>Ecole Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT) Photovoltaics and Thin-Film Electronics Laboratory (PV-Lab), Neuchâtel, Switzerland</i>), 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</p> <p>Perovskite/Silicon Monolithic Tandem Based on a P-type High-temperature Tolerant Silicon Bottom Cell</p>
15:30 - 16:00 B1-IS1	<p><u>Francesco Di Giacomo</u> (<i>TNO – partner in Solliance, PO Box 8550, 5605KN Eindhoven, The Netherlands</i>), 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</p> <p>Towards Stable Perovskite Solar Modules Made by Sheet to Sheet and Roll to Roll Fabrication</p>
16:00 - 16:30	Coffee Break
16:30 - 16:45 B1-O3	<p><u>Laurence Lutsen</u> (<i>1 IMEC, Imomec, Diepenbeek (Belgium)</i>), Dirk Vanderzance, Wouter Van Gompel, Roald Herckens, Paul-Henri Denis, Martijn Mertens, Tom Aernouts, Jan D'Haen, Bart Ruttens, Kristof Van Hecke</p> <p>Towards 2D Layered Hybrid Perovskites with Enhanced Functionality</p>
16:45 - 17:00 B1-O4	<p><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</p> <p>2D material engineering of perovskite solar cells: the emergence of MXenes</p>
17:00 - 17:15 B1-O5	<p><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</p> <p>A Bio-Inspired Route to 3D Lead-Halide Perovskites</p>
17:15 - 17:30 B1-O6	<p>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>)</p> <p>2D/3D Perovskite Heterostructures for High Performance and High Open Circuit Voltage in Wide-Bandgap Perovskite Photovoltaics</p>
Session C1 Chair: Lioz Etgar Room: Aula Magna	
14:30 - 14:45 C1-O8	<p><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</p> <p>Electron transport material modification for high-efficiency and stable flexible P3HT:O-IDTBR polymer solar cells blade coated in air from non-halogenated solvents</p>
14:45 - 15:00 C1-O7	<p><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 Pffannmüller, Sadok Ben Dkhil, Jean-Jacques Simon, Olivier Margeat, Christine Videlot-Ackermann, Jörg Ackermann</p> <p>A detailed stability study of highly efficient polymer solar cells based on ITIC derivatives</p>
15:00 - 15:15 C1-O1	<p>Jochen Kammerer, Rasmus Schröder, Irene Wacker, Riva Alkarsifi, Pavlo Perkhun, Christine Videlot-Ackermann, Olivier Margeat, Jörg Ackermann, <u>Martin Pffannmüller</u> (<i>Centre for Advanced Materials (CAM), Heidelberg University, Heidelberg, Germany</i>)</p> <p>Visualizing the surface morphology of non-fullerene acceptor blends by automated segmentation of spatially resolved electron spectra from ultra-low voltage scanning electron microscopy</p>
15:15 - 15:30 C1-O2	<p><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</p> <p>Fully Spray-Coated Organic Photovoltaic Cells with Green Solvents: Study of Interfaces and Scale-Up</p>



15:30 - 15:45 C1-03	<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 C1-04	<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>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
17:00 - 17:15 C1-05	<u>Juliane Bochert</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 C1-06	<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 Sirringhaus, 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 Chair: Filippo De Angelis Room: Aula Magna
09:00 - 09:45 G2.1-K1	<u>Mercouri Kanatzidis</u> (<i>Department of Chemistry, Northwestern University, Evanston, IL 60208, USA.</i>) Chemistry and Devices from Low Dimensional Halide Perovskites Semiconductors
09:45 - 10:15 G2.1-I1	<u>Naomi Ginsberg</u> (<i>Department of Physics, University of California, Berkeley, USA</i>), Milan Delor, Connor Bischak, Minliang Lai, Hannah Weaver, Dylan Lu, QinQin Yu, Peidong Yang, David Limmer Resolving Carrier Dynamics in Metal Halide Perovskites to Elucidate Structural Transformation Mechanisms and the Impact of Structural Heterogeneity on Transport
10:15 - 10:45 G2.1-I2	<u>Nitin Padture</u> (<i>Brown University</i>) 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 Chair: Mercouri Kanatzidis Room: Aula Magna
11:15 - 11:45 G2.2-I1	<u>Aditya Mohite</u> (<i>RICE UNIVERSITY</i>) From RT hysteresis free FETs to tailoring phase purity and orientation in layered 2D perovskites
11:45 - 12:15 G2.2-I2	<u>Liberato Manna</u> (<i>Department of Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova (Italy)</i>) Halide Perovskite Nanocrystals: Their Synthesis, Chemical, Structural, and Surface Transformations
12:15 - 12:45 G2.2-I3	<u>Osman M. Bakr</u> (<i>Materials Science and Engineering, King Abdullah University of Science and Technology (KAUST), Saudi Arabia</i>) Nanoscale and Bulk Perovskite Single-Crystals: Surface Engineering for Efficient LEDs, Photodetectors, and Solar Cells
12:45 - 13:15 G2.2-I4	<u>Christopher Case</u> (<i>Oxford PV</i>) From PERC to passivated contacts to perovskite: the path to increasing efficiency
13:15 - 14:30	Lunch Break

**Session A2**Chair: Naomi Ginsberg
Room: Aula Minor

- 14:30 - 15:00
A2-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
- 15:00 - 15:15
A2-O1 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
Molecular Imprinted Polypyrrole Counter Electrode for Quasi-Solid DSSCs
- 15:15 - 15:30
A2-O2 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
Surface Engineering Dye-sensitized Solar Cells
- 15:30 - 15:45
A2-O3 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
On the Role of the Anchoring Unit in the Efficiency of Pyranoanthocyanin-based Dye-Sensitized Solar Cells
- 15:45 - 16:00
A2-O4 Matteo Bonomo (*University of Turin, Department of Chemistry and NIS Interdepartmental Center*), Emmanuel Ekoi, Claudia Barolo, Denis Dowling, Danilo Dini, Aldo Di Carlo
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
A2-O5 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
Facile Exciton Diffusion in Fused Ring Electron Acceptor Films
- 16:45 - 17:00
A2-O6 Philip Bellchambers (*Department of Chemistry, University of Warwick, CV4 7AL, Coventry, United Kingdom*), Silvia Varagnolo, Ross Hatton
High-Performance Cu Mesh Transparent Conductive Electrodes for Flexible Organic Photovoltaics
- 17:00 - 17:15
A2-O7 Enrique Pascual-San-José (*Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)*), Xabier Rodríguez-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
A2-O8 Kieran Walsh (*School of Physics, University of Exeter*), Conor Murphy, Adolfo De Sanctis, Christos Melios, Saverio Russo, Monica Craciun
FeCl₃ intercalated graphene electrodes for photovoltaic energy harvesting

Session B2Chair: Eva Barea
Room: Aula 11

- 14:30 - 14:45
B2-O7 Juan F. Galisteo-López (*Instituto de Ciencia de Materiales de Sevilla, Consejo Superior de Investigaciones Científicas*), Mauricio E. Calvo, Cristina T. Rojas, Hernán Míguez
Mechanism of Photoluminescence Intermittency in Organic-Inorganic Perovskite Nanoparticles
- 14:45 - 15:00
B2-O8 Manon Spalla (*LEPMI / Université Savoie Mont Blanc*), Lara Perrin, Emilie Planes, Muriel Matheron, Solenn Berson, Lionel Flandin
Stability of mixed cation perovskite solar cells: understanding of involved mechanisms
- 15:00 - 15:15
B2-O1 Endre Horvath (*EPFL SB IPHYS LPMC*), Massimo Spina, Balint Nafradi, Eric Bonvin, Marton Kollar, Andrzej 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 Genova, Italy*), Liberato Manna
B2-O2 Beyond the crystal lattice of lead halide perovskites: The curious cases of Cs₄PbX₆, Cs(Pb:Mn)I₃, Cs₂PbI₂Cl₂ and CsPb(Cl:Br:I)₃ nanocrystals
- 15:30 - 16:00 **Angshuman Nag** (*Department of Chemistry, Indian Institute of Science Education and Research (IISER), Pune 411008, India*)
B2-IS1 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, Tooin University of Yokohama, 1614, Kurogane-cho, Aoba, Yokohama, Kanagawa, Japan 225-8503*), Tsutomu Miyasaka
B2-O3 Performance Deterioration and Stability issues with Organic-inorganic hybrid and All-inorganic Perovskite Solar Cells
- 16:45 - 17:00 **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
B2-O4 Admittance spectroscopy and DLTS measurements on multication mesoscopic perovskite solar cells
- 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**
Chair: Udo Bach
Room: Aula Magna
- 14:30 - 14:45 **Nishat Sultana** (*Department of Physics, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand*), Nicholas J. Demarais, Denys Shevchenko
C2-O5 Unveiling the Degradation mechanism of Perovskite Solar Cells by the Laser Desorption/Ionization Mass Spectrometry
- 14:45 - 15:00 **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
C2-O6 Optical and Electronic Property Changes in Lead-free Perovskites by Metal Cation Transmutation
- 15:00 - 15:30 **Lioz Etgar** (*Institute of Chemistry, Hebrew University of Jerusalem*)
C2-IS2 Low Dimensional Perovskite: Stability, Solar Cells and Nanostructures
- 15:30 - 15:45 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*)
C2-O1 Relationship between Relative Lattice Strain and Efficiency for Sn-Perovskite Solar Cells
- 15:45 - 16:00 **Lucija Rakocevic** (*IMEC, Leuven*), Felix Ernst, Robert Gehlhaar, Tom Aernouts, Christoph Brabec, Jef Poortmans
C2-O2 Reliable comparison of perovskite solar cell performance using maximum power point tracking
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 17:00 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
C2-IS1 Near Infra-Red Dyes in Dye-Sensitized Solar Cells: from Panchromatic Absorption to Completely Transparent DSSCs
- 17:00 - 17:15 **Francesca Tessore** (*Dipartimento di Chimica, Università degli Studi di Milano*), Gabriele Di Carlo, Alessio Orbelli
C2-O3 Biroli, Elisabetta Benazzi, Stefano Caramori
HIGH-POTENTIAL PORPHYRIN-BASED SnO₂ PHOTOANODES for WATER PHOTOOXIDATION



17:15 - 17:30 Ingrid Rodríguez-Gutiérrez, Manuel Rodríguez-Pérez, Alberto Vega-Poot, Geonel Rodríguez-Gattorno, Gerko C2-O4 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 and HOPV20 presentation**

Session G3.1

Chair: Aldo Di Carlo
Room: Aula Magna

09:00 - 09:45 Xiaoyang Zhu (*Department of Chemistry, Columbia University, New York, New York 10027, United States*)
G3.1-K1 Ferroelectric large polarons in lead halide perovskites

09:45 - 10:15 Efrat Lifshitz (*Schulich Faculty of Chemistry, Russell Berrie Nanotechnology Institute, Solid State Institute, Technion-Israel Institute of Technology*)
G3.1-I1 Magnetic Interactions in Pristine and Magnetically Doped Halide-Perovskites

10:15 - 10:45 Prashant V. Kamat (*Radiation Laboratory, Department of Chemistry & Biochemistry, University of Notre Dame*),
G3.1-I2 Rebecca Scheidt, Gergely Samu, Csaba Janaky
Halide Ion Migration in Mixed Halide Lead Perovskites

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

Session G 3.2

Chair: Efrat Lifshitz
Room: Aula Magna

11:15 - 11:45 James Durrant (*Department of Chemistry and Centre for Plastic Electronics, Imperial College London*)
3.2-I1 Charge Carrier Dynamics in Disordered Materials for Solar Energy Conversion

11:45 - 12:15 Oleg Prezhdo (*Chemistry, University of Southern California*)
3.2-I2 Time-Domain Modeling of Excited State Dynamics in Halide Perovskites

12:15 - 12:45 Samuel Stranks (*Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK.*)
3.2-I3 Visualising the Impact of Defects and Strain on Halide Perovskite Structures

12:45 - 13:15 Joseph Berry (*Chemistry and Nanoscience National Renewable Energy Laboratory*)
3.2-I4 Pathway to Halide Perovskite Photovoltaics: Two Recent Advances in All Perovskite Tandems

13:15 - 14:30 **Lunch Break**

Session A3

Chair: Francisco Fabregat-Santiago
Room: Aula Minor

14:30 - 15:00 Aleksandra Djurisić (*Department of Physics, The University of Hong Kong*), Fangzhou Liu, Ho Won Tam, Tik Lun
A3-IS1 Leung
Towards Improved Stability of Organic-Inorganic Perovskite Solar Cells

15:00 - 15:15 Ihtezaz Muhaimin Hossain (*Institute of Microstructure Technology, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany*), Yidenekechew Donie, Raphael Schmager,
A3-O3 Mohamed S. Abdelkhalik, Andrei Karabanov, Somayeh Moghadamzadeh, Jonas A. Schwenzer, Uli Lemmer, Bryce S. Richards, Guillaume Gomard, Ulrich W. Paetzold
Nanophotonic front electrodes for perovskite-based tandem photovoltaics

15:15 - 15:30 Alexander J. Bett, Patricia S.C. Schulze, Kristina M. Winkler (*Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, 79110 Freiburg, Germany*), Özde Kabakli, Martin Bivour, Ludmila Cojocaru, Ines Ketterer,
A3-O4 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** Ricardo Razera (*École Polytechnique Fédérale de Lausanne EPFL, CH*), Peter Fiala, Fan Fu, Florent Sahli, 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** Rebecca Belisle (*Department of Physics, Wellesley College*), 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** Marko Jost (*Young Investigator Group Perovskite Tandem Solar Cells, Helmholtz-Zentrum Berlin*), Tobias Bertram, Dibyashree Koushik, Jose A. Marquez, Marcel A. Verheijen, Eike Köhnen, Amran Al-Ashouri, Thomas Unold, Mariadriana Creatore, Iver Lauermann, 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** Yangying Zhou (*State Key Laboratory of New Ceramics & Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, P. R. China.*), Hong Lin
Perovskite Solar Cell-Thermoelectric Tandem System with a High Efficiency of Over 23%
- 17:00 - 17:15 **A3-O7** Heping Shen (*Research School of Engineering, The Australian National University*), Stefan Omelchenko, Daniel Jacobs, Sisir Yalamanchili, Nathan Lewis, Kylie Catchpole
In situ recombination junction between p-Si and TiO₂ enables high-efficiency monolithic perovskite/Si tandem cells
- 17:15 - 17:30 **A3-O8** Lukas Wagner (*Fraunhofer-Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, D-79110 Freiburg, Germany*), Simone Mastroianni, Andreas Hinsch
The Carbon Footprint of Solar Cells: How the Ultimate Lower Limit Can Be Reached with Perovskites

Session B3

Chair: Samuel D. Stranks

Room: Aula 11

- 14:30 - 14:45 **B3-O7** Tae-Woong Kim, Ludmila Cojocar, Satoshi Uchida (*Research Center for Advanced Science and Technology (RCAST), The University of Tokyo*), Tomonori Matsushita, Takashi Kondo, Hiroshi Segawa
High Resolution TEM Observation of MAPbI₃ Perovskite Solar cells with Superlattice
- 14:45 - 15:00 **B3-O8** Eva M. Barea (*Institute of Advanced Materials (INAM), Universitat Jaume 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 **B3-O5** 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
Nitrogen soaking promotes lattice recovery in polycrystalline hybrid perovskites
- 15:15 - 15:30 **B3-O6** Alessio Gagliardi (*Technische Universität München*), Jared Stanley
Novel machine learning method for stability and energy bandgap prediction of lead free perovskite materials
- 15:30 - 16:00 **B3-IS1** 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
- 16:00 - 16:30 **Coffee Break**
- 16:30 - 16:45 **B3-O1** 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
Hot Carrier Dynamics in Lead Halide Perovskites: Mobility and Carrier-Phonon Coupling
- 16:45 - 17:00 **B3-O2** Sandy Sanchez (*École Polytechnique Fédérale de Lausanne EPFL, CH*)
Flash infrared annealing method: the pulse time to control the perovskite crystal nucleation and growth from solution



17:00 - 17:15 B3-O3	<u>Paramvir Ahlawat</u> (<i>Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland</i>), Michele Parrinello, Ursula Rothlisberger Atomistic Simulations of Nucleation of Lead Halide Perovskites
17:15 - 17:30 B3-O4	<u>Kelly Schutt</u> (<i>University of Oxford, GB</i>), Pabitra Nayak, Alexandra Ramadan, Bernard Wenger, Yen-Hung Lin, Henry Snaith Overcoming Zinc Oxide Interface Instability with Methylammonium-free Perovskites for High Performance Solar Cells
Session C3 Chair: Claudia Barolo Room: Aula Magna	
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14:45 - 15:00 C3-O6	<u>Stuart Macpherson</u> (<i>Cavendish Laboratory, Department of Physics, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK</i>), Andrew Winchester, Elizabeth Tennyson, Krzysztof Galkowski, Tiarnan Doherty, Miguel Anaya, Christopher Petoukhoff, Michael Man, Keshav Dani, Samuel Stranks Modulating Nanoscale Defect States in Halide Perovskite Films
15:00 - 15:30 C3-IS2	<u>Udo Bach</u> (<i>ARC Centre of Excellence in Exciton Science, Department of Chemical Engineering, Monash University, Clayton, VIC, Australia</i>), Wenxin Mao Towards Single-Crystalline Perovskite Devices
15:30 - 15:45 C3-O3	<u>Mathias Uller Rothmann</u> (<i>Department of Physics, University of Oxford</i>), Judy Kim, Juliane Borchert, Kilian Lohmann, Colum O'Leary, Alex Shearer, Michael Johnston, Henry Snaith, Peter Nellist, Laura Herz Reliable Atomic-Resolution Observations of the Nanoscopic Properties of Hybrid Perovskite Thin Films
15:45 - 16:00 C3-O4	<u>Gergely Samu</u> (<i>Department of Physical Chemistry and Materials Science, Interdisciplinary Excellence Centre, University of Szeged</i>), R.A. Scheidt, A. Balog, C. Janáky, P.V. Kamat Modulation of Excited State Dynamics in Lead Halide Perovskite Films with Electrical Bias
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17:00 - 17:15 C3-O2	<u>David McMeekin</u> (<i>Clarendon Laboratory, Department of Physics, Oxford University, Oxford OX1 3PU, UK</i>), Suhas Mahesh, Nakita Noel, Matthew Klug, JongChul Lim, Jonathan Warby, James Ball, Laura Herz, Michael Johnston, Henry Snaith Solution-Processed All-Perovskite Multi-Junction Solar Cells
17:15 - 17:30 C3-O1	<u>Claire Burgess</u> (<i>Department of Applied Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands</i>), Farzad Mardekati 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

002	<u>Hooman Mehdizadeh Rad</u> (<i>Charles Darwin University</i>), Jai Singh Study of Diffusion Length of Charge Carriers in Perovskite Solar Cells
004	<u>Loreta Angela Muscarella</u> (<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	<u>Loreta Angela Muscarella</u> (<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	<u>BongSoo Kim</u> (<i>Ulsan National Institute of Science and Technology (UNIST), KR</i>) Structure-to-photovoltaic property relationships in rhodanine-based small molecule acceptors
008	<u>Jovana Milic</u> (<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	<u>Silvia Motti</u> (<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	<u>Dengyang Guo</u> (<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	<u>Lucie McGovern</u> (<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	<u>Nick Vlachopoulos</u> (<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	<u>Cheng-Hung Hou</u> (<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	<u>Andrea Rubino</u> (<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	<u>Ajay Singh</u> (<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	<u>YOUNGU LEE</u> (<i>Daegu Gyeongbuk Institute of Science and Technology</i>) Regioregular Terpolymers for High-Performance Organic Photovoltaic Devices
042	<u>Sameh Hamzawy</u> (<i>Intelligent Polymer Research Institute, University of Wollongong</i>), Pawel Wagner, Attila Mozer, Andrew Nattestad Redox Mediators Effect on The Up-Conversion System Performance for Intermediate Band Dye Solar Cells Applications
047	<u>Isabella Poli</u> (<i>Dept. of Chemistry & Centre for Sustainable Chemical Technologies, University of Bath, Claverton Down, Bath BA2 7AY, UK</i>), 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	<u>Seyedali Emami</u> (<i>LEPABE, Departamento de Engenharia Química, Universidade do Porto – Faculdade de Engenharia, Rua Dr. Roberto Frias s/n 4200-465 Porto, Portugal</i>), Dzmitry Ivanou, Adélio Mendes LASER-ASSISTED GLASS FRIT ENCAPSULATION of HTM-FREE PEROVSKITE SOLAR CELLS
056	<u>Leonardo Buizza</u> (<i>Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, United Kingdom</i>), 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	<u>Inseong Cho</u> (<i>Intelligent Polymer Research Institute, University of Wollongong</i>), Peter Innis, Attila Mozer Exploiting intermolecular interaction between alkyl-functionalised electron donor-acceptor pairs as a strategy to enhance electron transfer kinetics
060	<u>Hsin-Hsiang Huang</u> (<i>Department of Materials Science and Engineering, National Taiwan University, Taipei 10617, Taiwan.</i>), Leeyih Wang, King-Fu Lin High-Performance and Robust CH ₃ NH ₃ PbI ₃ /Nanoclay Hybrid Perovskite Solar Cells Under High-Humidity Condition
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