

## International Conference on Hybrid and Organic Photovoltaics (HOPV22)

**València, Spain, 2022 May 19th - 25th**

**Conference organizers: Pablo Docampo, Eva Unger and Elizabeth Gibson**

### Conference Program

| May 19th - Day 1 (Thursday) 1 |                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| 10:00 - 10:05                 | <b>nanoGe Introduction</b>                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10:05 - 10:15                 | <b>Opening</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                               | <b>Keynote</b><br>Chair: Pablo Docampo                                                                                                                                                                                                                                                                                                                                                                                               |
| 10:15 - 10:45<br>Keynote-K1   | <u>Mingzhen Liu</u> ( <i>University of Electronic Science and Technology of China</i> )<br>Highly Efficient and Stable Perovskite Solar Cells by Vapour Deposition                                                                                                                                                                                                                                                                   |
| 10:45 - 10:55                 | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                               | <b>Session G1</b><br>Chair: Pablo Docampo                                                                                                                                                                                                                                                                                                                                                                                            |
| 10:55 - 11:15<br>G1-I1        | <u>Yana Vaynzof</u> ( <i>Technical University (TU) Dresden, DE</i> )<br>A Hybrid Approach to Efficient All-Inorganic Perovskite Solar Cells                                                                                                                                                                                                                                                                                          |
| 11:15 - 11:35<br>G1-I2        | <u>Antonio Abate</u> ( <i>Helmholtz-Zentrum Berlin</i> )<br>Tin-based perovskite solar cells                                                                                                                                                                                                                                                                                                                                         |
| 11:35 - 11:55<br>G1-I3        | <u>Paulina Plochocka</u> ( <i>Laboratoire National des Champs Magnetiques Intenses, CNRS-UJF-UPS-INSA, Toulouse, France</i> )<br>Excitons and Phonons in 2D perovskites                                                                                                                                                                                                                                                              |
| 11:55 - 12:10                 | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 12:10 - 12:40                 | <b>Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 12:40 - 12:45                 | <b>Chair Introduction</b>                                                                                                                                                                                                                                                                                                                                                                                                            |
|                               | <b>Keynote</b><br>Chair: Elizabeth Gibson                                                                                                                                                                                                                                                                                                                                                                                            |
| 12:45 - 13:15<br>Keynote-K1   | <u>Edward Sargent</u> ( <i>Department of Electrical and Computer Engineering, University of Toronto, Canada</i> )<br>Progress in inverted perovskite photovoltaics for stability                                                                                                                                                                                                                                                     |
| 13:15 - 13:25                 | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13:25 - 13:30                 | <b>nanoGe Announcement</b>                                                                                                                                                                                                                                                                                                                                                                                                           |
|                               | <b>Session A1 - DSC</b><br>Chair: Edward Sargent                                                                                                                                                                                                                                                                                                                                                                                     |
| 13:30 - 13:40<br>DSC-T1       | <u>Ana Lucia Pinto</u> ( <i>LAQV-REQUIMTE, Chemistry Department, NOVA School of Science and Technology, Campus de Caparica, 2829-516, Caparica, Portugal.</i> ), Patrícia Máximo, João Pina, Giuseppe Calogero, César A. T. Laia, A. Jorge Parola, J. Carlos Lima<br>Amino-based Anthocyanin Dyes: Exploring the Relation Between Structural Rigidification and Back-Electron Transfer                                               |
| 13:40 - 13:50<br>DSC-T2       | <u>Marco Giordano</u> ( <i>Dipartimento di Chimica, NIS Interdepartmental and INSTM Reference Centre, Università di Torino, Torino, Italy</i> ), G Renno, N. Barbero, S. M. Zakeeruddin, M. Grätzel, C. Barolo, A. Fin, G. Viscardi<br>Effect of Out-of-Plane Alkyl Chains in Dye-Sensitized Solar Cell Efficiency: a Structure-Property Relationship in Novel Perimidine-Based Squaraine Dyes                                       |
| 13:50 - 14:00<br>DSC-T3       | <u>Agustín O. Alvarez</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12071, Castelló de la Plana, Spain</i> ), Sandheep Ravishankar, Elena Más Marza, Francisco Fabregat-Santiago<br>Improving optoelectronic characterization by combining modulated techniques                                                                                                                                              |
| 14:00 - 14:10<br>DSC-T4       | <u>Paula Hartnagel</u> ( <i>Institut für Energie und Klimaforschung (IEK-5), Forschungszentrum Jülich GmbH, D-52425 Jülich, Deutschland</i> ), Benjamin Klingebiel, Oliver Thimm, Thomas Kirchartz<br>Comparing Methods of Characterizing Energetic Disorder in Organic Solar Cells                                                                                                                                                  |
| 14:10 - 14:40                 | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                               | <b>Session B1 - Manufacturing I</b>                                                                                                                                                                                                                                                                                                                                                                                                  |
| 13:30 - 13:40<br>I-T1         | <u>Luigi Vesce</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome "Tor Vergata", via del Politecnico 1, 00133 Rome, Italy</i> ), Maurizio Stefanelli, Luigi Angelo Castriotta, Bowen Yang, Afshin Hadipour, Stijn Lammar, Jiajia Suo, Tom Aernouts, Anders Hagfeldt, Aldo Di Carlo<br>Interfacial Defects Passivation of High Efficiency Perovskite Solar Modules |
| 13:40 - 13:50<br>I-T2         | <u>Adriano Marques</u> ( <i>ONINN</i> ), Barbara H. S. Miranda, Luiza de Q. Corrêa, Gabriela de A. Soares, Sílvia L. Fernandes, Izabela S. Bicalho, Fernanda Guimarães, Maria Luiza Vilela, Jair Rodrigues, Rodrigo Vilça, Diego Bagnis<br>Towards Perovskite Solar Cells Full Production: Main Upscale Challenges                                                                                                                   |
| 13:50 - 14:00<br>I-T3         | <u>Alexey Tarasov</u> ( <i>Laboratory of New Materials for Solar Energetics, Department of Materials Science, Lomonosov Moscow State University (MSU)</i> ), Andrei Tutantsev, Ekaterina Marchenko, Natalia Udaloa, Sergey Fateev, Eugene Goodilin<br>Structural disorder and stability issues – two heels of Achilles of layered hybrid halide perovskites                                                                          |
| 14:00 - 14:10<br>I-T4         | <u>Anthony Maho</u> ( <i>CESAM-GREENMAT, University of Liège, Allée du Six-Août 13, Sart-Tilman, 4000 Liège, Belgium.</i> ), Nathan Daem, Michaël Lobet, Pierre Piron, Alexandre Mayer, Pierre Colson, Jérôme Loicq, Catherine Henrist, Rudi Cloots, Jennifer Dewalque<br>Photonic Structuration of Perovskite Solar Cells Towards Enhanced Light Absorption                                                                         |
| 14:10 - 14:40                 | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14:40 - 15:00                 | <b>Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 15:00 - 16:00                 | <b>ePoster session</b>                                                                                                                                                                                                                                                                                                                                                                                                               |

| May 20th - Day 2 (Friday) 2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 10:00 - 10:05                  | <b>nanoGe Introduction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 10:05 - 10:15                  | <b>Opening</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                | <b>Session G2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10:15 - 10:35<br>G2-I1         | <u>Qing Shen</u> ( <i>The University of Electro-Communications, Japan</i> ), Yusheng Li, Hua Li, Chao Ding<br>Optical property, photoexcited carrier dynamics and application to solar cells of perovskite nanocrystals                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 10:35 - 10:55<br>G2-I2         | <u>Giulia Grancini</u> ( <i>Dipartimento di Chimica, Università di Pavia</i> )<br>2D or not 2D Perovskite Passivation? Strategies behind high Efficient Perovskite Solar Cells.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 10:55 - 11:15<br>G2-I3         | <u>Jacinto Sa</u> ( <i>Department of Chemistry-Angstrom, Uppsala University</i> )<br>Plasmonics photophysics basics and their photovoltaic application                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 11:15 - 11:30                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11:30 - 11:35                  | <b>nanoGe Announcement</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11:35 - 12:00                  | <b>Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                | <b>Session A2.1 - Light management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 12:00 - 12:10<br>management-T1 | <u>Carlos Romero-Pérez</u> ( <i>Instituto de Ciencia de Materiales de Sevilla (ICMS), Consejo Superior de Investigaciones Científicas (CSIC), Universidad de Sevilla</i> ), Andrea Rubino, Laura Calì, Mauricio Calvo, Hernán Míguez<br>Template-assisted synthesis of optically active CsPbI <sub>3</sub> quantum dots                                                                                                                                                                                                                                                                                                                                                                  |
| 12:10 - 12:20<br>management-T2 | <u>Arghanoon Moeini</u> ( <i>Universidad de Valencia - ICMol (Institute of Molecular Science)</i> )<br>Optimization of low band-gap perovskite for photovoltaics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 12:20 - 12:30<br>management-T3 | <u>Yonghua Chen</u> ( <i>Nanjing Tech University</i> )<br>Proton ionic liquid for Perovskite Solar Cells                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12:30 - 12:50                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | <b>Session B2.1 - Organic semiconductor physics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12:00 - 12:10<br>physics-T1    | <u>Enas Moustafa</u> ( <i>Department of Electronic, Electric and Automatic Engineering, Universitat Rovira i Virgili, 43007 Tarragona, Spain</i> ), Josep Pallarès, Lluís Marsal<br>Dependency of the PM6:Y7 Binary Organic Photovoltaics Performance on the role of Solvent Additive and Thermal Treatment                                                                                                                                                                                                                                                                                                                                                                              |
| 12:10 - 12:20<br>physics-T2    | <u>Yakun He</u> ( <i>Institute of Materials for Electronics and Energy Technology (i-MEET), Friedrich-Alexander-Universität Erlangen-Nürnberg, Martensstrasse 7, 91058 Erlangen, Germany</i> ), Ning Li, Thomas Heumüller, Jonas Wortmann, Benedict Hanisch, Anna Aubele, Sebastian Lucas, Guitao Feng, Xudong Jiang, Weiwei Li, Peter Bäuerle, Christoph Brabec<br>Ultrastable single-component organic solar cells: the next frontier towards industrial viability                                                                                                                                                                                                                     |
| 12:20 - 12:30<br>physics-T3    | <u>Junjun Guo</u> ( <i>University College London UCL</i> )<br>interfacial triplet formation as a function of morphology in organic solar cell                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 12:30 - 12:50                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | <b>Session A2.2 - Manufacturing II: Slot-die coating</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12:50 - 13:00<br>coating-T1    | <u>Janardan Dagar</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, aYoung Investigator group Hybrid Materials Formation and Scaling, Kekuléstr. 5, Berlin 12489, Germany</i> ), Jinzhao Li, Oleksandra Shargaieva, Markus Fenske, Christof Schultz, Florian Mathies, Kari Sveinbjörnsson, Hans Köbler, Sergei Trofimov, Boris Naydenov, Karunanantharajah Prashanthan, Rowan MacQueen, Gopinath Parmasivam, Igal Levine, Ivo Zizak, Rutger Schlatmann, Bert Stegemann, Antonio Abate, Steve Albrecht, Emil List- Kratochvil, Eva Unger<br>Slot-die coated perovskite solar cell with 22% power conversion efficiency and minimodules via grain boundaries passivation |
| 13:00 - 13:10<br>coating-T2    | <u>Alejandra Florez Velasquez</u> ( <i>Centro de Investigación y Desarrollo de Materiales (CIDEMAT), Universidad de Antioquia</i> ), Daniel Ramirez Zora, Franklin Jaramillo Isaza<br>Improving the reproducibility of hybrid perovskite film deposition by Slot-Die Coating                                                                                                                                                                                                                                                                                                                                                                                                             |
| 13:10 - 13:20<br>coating-T3    | <u>Jinzhao Li</u> ( <i>HySPRINT Innovation Lab, Department Solution-Processing of Hybrid Materials and Devices, Helmholtz Zentrum Berlin, Berlin, Germany</i> ), Eva Unger, Janardan Dagar<br>Efficient inverted perovskite solar cells by slot die coating                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 13:20 - 13:40                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | <b>Session B2.2 - Stability and interfaces</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 12:50 - 13:00<br>interfaces-T1 | <u>Mehmet Derya Özeren</u> ( <i>Wigner Research Centre for Physics</i> ), Bea Botka, Áron Pekker, Katalin Kamarás<br>In-situ Evaluation of Water Interactions with Large Organic Cation Passivated MAPbX <sub>3</sub> by Using Photoluminescence Spectroscopy                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 13:00 - 13:10<br>interfaces-T2 | <u>Salvatore Valastro</u> ( <i>Institute for Microelectronics and Microsystems (CNR-IMM), Zona Industriale - VIII Strada 5, Catania 95121, Italy</i> ), Giovanni Mannino, Emanuele Smecca, Corrado Bongiorno, Salvatore Sanzaro, Ioannis Deretzis, Antonino La Magna, Ajay Jena, Tsutomu Miyasaka, Alessandra Alberti<br>Black-Yellow Bandgap Trade-off during Thermal Stability Tests in Low-Temperature Eu-doped CsPbI <sub>3</sub>                                                                                                                                                                                                                                                    |
| 13:10 - 13:20<br>interfaces-T3 | <u>Juliana Morbec</u> ( <i>School of Chemical and Physical Sciences, Keele University, UK</i> )<br>Organic molecules meets transition metal dichalcogenides for solar energy conversion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 13:20 - 13:40                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | <b>Keynote</b><br>Chair: Elizabeth Gibson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 13:40 - 14:10<br>Keynote-K1    | <u>Yiyang Wu</u> ( <i>The Ohio State University</i> )<br>From Dye Sensitization to Halide Perovskite Solar Cells: My Personal Struggle with Transitions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 14:10 - 14:20                  | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| May 22nd - Day 4 (Sunday) 4 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 17:30 - 18:00               | <b>Registration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 18:00 - 19:00               | <b>Welcome drink</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| May 23rd - Day 5 (Monday) 5 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 08:00 - 08:35               | <b>Registration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 08:35 - 08:40               | <b>Announcement of the day</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 08:40 - 08:50               | <b>Opening</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 08:50 - 09:00               | <b>RSC - Announcement</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                             | <b>Keynote</b><br>Chair: Pablo Docampo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 09:00 - 09:45<br>Keynote-K1 | <u>Samuel Stranks</u> ( <i>University of Cambridge</i> )<br>Nanoscale heterogeneity in halide perovskites: the good, the bad and the ugly                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                             | <b>Session G1.1</b><br>Chair: Pablo Docampo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 09:45 - 10:15<br>G1.1-I1    | <u>Emilio Palomares</u> ( <i>ICIQ-BIST. Avda. Països Catalans, 16. Tarragona. E-43007. Spain</i> )<br>Molecular Approaches to Energy Conversion                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10:15 - 10:45<br>G1.1-I2    | <u>Piers Barnes</u> ( <i>Imperial College London, Physics Department and Center for Processable Electronics</i> ), William Fisher, Davide Moia, Phil Calado<br>How much mobile ionic charge makes a difference to perovskite solar cells?                                                                                                                                                                                                                                                                                                                                                             |
| 10:45 - 11:15               | <b>Coffee Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                             | <b>Session G1.2</b><br>Chair: Sam Stranks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 11:15 - 11:45<br>G1.2-I1    | <u>Filippo De Angelis</u> ( <i>Computational Laboratory for Hybrid/Organic Photovoltaics (CLHYO), Istituto CNR di Scienze e Tecnologie Chimiche "Giulio Natta" (CNR-SCITEC), Perugia, 06123 Italy</i> )<br>From Perovskite Photovoltaics to Perovskite Photocatalysis: New challenges for modeling (and some exciting result)                                                                                                                                                                                                                                                                         |
| 11:45 - 12:15<br>G1.2-I2    | <u>Petra Cameron</u> ( <i>Department of Chemistry, University of Bath, Claverton Down, Bath BA2 7AY, UK</i> ), Kaya Davies Brenchley, Ulrich Hintermair, Jenny Baker<br>Running Perovskite Solar Cells Underwater - Light Driven Water Oxidation using Caesium Lead Bromide Solar Cells                                                                                                                                                                                                                                                                                                               |
| 12:15 - 12:20               | <b>LayTec AG - Industrial talk</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | <b>Session G1.3</b><br>Chair: Sam Stranks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 12:20 - 12:50<br>G1.3-I1    | <u>Claudia Barolo</u> ( <i>Dipartimento di Chimica, NIS Interdepartmental and INSTM Reference Centre, Università degli Studi di Torino, Via Pietro Giuria 7, 10125 Torino, Italy</i> ), Nadia Barbero, Matteo Bonomo, Marco Giordano, Ana Yancy Segura Zarate, Simone Galliano, Waad Naim, Fionnuala Grifoni, Raffaele Borrelli, Fabio Matteocci, Pauline Chotard, Sylvain Ceurstemont, Franck Barath, Aldo Di Carlo, Frederic Sauvage<br>Toward non-intrusive BIPV: strategies for NIR-selective DSSCs                                                                                               |
| 12:50 - 13:20<br>G1.3-I2    | <u>Feng Gao</u> ( <i>Linköping University</i> )<br>A new doping strategy of Spiro-OMeTAD: towards Instantly Efficient and Stable Perovskite Solar Cells                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 13:20 - 15:00               | <b>Lunch break</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | <b>Session A1 - Advanced Characterisation I</b><br>Chair: Rebecca Milot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 15:00 - 15:30<br>I-I51      | <u>Iván Mora-Seró</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> )<br>New perspectives in outdoors tracking and characterization of perovskite solar cells                                                                                                                                                                                                                                                                                                                                                                     |
| 15:30 - 15:45<br>I-O1       | <u>Bas van Gorkom</u> ( <i>Molecular Materials and Nanosystems, Institute for Complex Molecular Systems, Eindhoven University of Technology, The Netherlands</i> ), Tom van der Pol, Kunal Datta, Martijn Wienk, René Janssen<br>Revealing Defective Interfaces in Perovskite Solar Cells from Highly Sensitive Sub-bandgap Photocurrent Spectroscopy Using Optical Cavities                                                                                                                                                                                                                          |
| 15:45 - 16:00<br>I-O2       | <u>Tomi Baikie</u> ( <i>Department of Physics, Cavendish Laboratory, University of Cambridge; Cambridge, UK</i> ), Philip Calado, Krzysztof Galkowski, Zahra Andaji-Garmaroudi, Akshay Rao, Sam Stranks, Jenny Nelson, Piers Barnes<br>Understanding Surface Photovoltage Measurements on Metal Halide Perovskite Bilayers                                                                                                                                                                                                                                                                            |
| 16:00 - 16:15<br>I-O3       | <u>Parth Raval</u> ( <i>Univ. Lille, CNRS, Centrale Lille Institut, Univ. Artois, UMR 8181-UMCCS-Unité de Catalyse et Chimie du Solide, F-59000 Lille, France</i> ), Rhiannon Kennard, Eugenia Vasileiadou, Clayton Dahlman, Margot Dhennin, Tomasz Pawlak, Mohammad Ali Akhavan Kazemi, Olivier Lafon, Laurent Delevoye, Frédéric Sauvage, Ioannis Spanopoulos, Pascal Roussel, Hervé Vezin, Micheal Chabincyn, Thuc-Quyen Nguyen, Mercouri Kanatzidis, G N Manjunatha Reddy<br>Understanding morphology, microstructure, and stability of photovoltaic materials using solid-state NMR spectroscopy |
| 16:15 - 16:30<br>I-O4       | <u>Folusho Helen Balogun</u> ( <i>Department of Physics, University of Warwick, Coventry CV4 7AL.</i> ), Dumitru Sirbu, Nathaniel P. Gallop, Jake D. Hutchinson, Nathan Hill, Jack M. Woolley, Michael Staniforth, Pablo Docampo, Rebecca L. Milot<br>Untangling Free Carrier and Exciton dynamics in Layered Hybrid Perovskites using Time-Resolved Terahertz Spectroscopy                                                                                                                                                                                                                           |
| 16:30 - 16:45<br>I-O5       | <u>Himanshu Phirke</u> ( <i>University of Luxembourg, Scanning Probe Microscopy Laboratory, Department of Physics and Materials Science</i> ), Ajay Singh, Jeremy Hieulle, Alex Redinger, Anurag Krishna<br>Inhomogeneities in lead halide perovskite absorbers revealed by quantitative Photoluminescence Imaging                                                                                                                                                                                                                                                                                    |
| 16:45 - 17:00<br>I-O6       | Zubair Ahmad, <u>Ehsan Raza</u> ( <i>Qatar University Young Scientists Center (QUYSC), Qatar University, 2713, Doha, Qatar</i> )<br>Electrochemical impedance spectroscopy technique for 2D/3D n-i-p structured perovskite solar cells                                                                                                                                                                                                                                                                                                                                                                |
|                             | <b>Session B1 - Defects I</b><br>Chair: Piers Barnes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| 15:00 - 15:30<br>I-IS1                                                       | <u>Lioz Etgar</u> ( <i>The Hebrew University of Jerusalem, The Institute of Chemistry, Casali Center for Applied Chemistry, Jerusalem, Israel</i> )<br>Bifacial Fully printable low dimensional perovskite solar cells                                                                                                                                                                                                                                                                                                                                               |
| 15:30 - 15:45<br>I-O1                                                        | <u>Daniel Jacobs</u> ( <i>Photovoltaics and Thin Film Electronics Laboratory, École polytechnique fédérale de Lausanne</i> ), Christian Wolff, Xin Yu Chin, Christophe Ballif, Quentin Jeangros<br>Degradation due to Transverse Ion Migration in Perovskite Devices                                                                                                                                                                                                                                                                                                 |
| 15:45 - 16:00<br>I-O2                                                        | <u>Francisco Peña-Camargo</u> ( <i>Universität Potsdam, Soft Matter Physics, Karl-Liebknecht-Straße 24-25, 14476 Potsdam, Germany</i> ), Jarla Thiesbrummel, Hannes Hempel, Artem Musienko, Vincent M. Le Corre, Jonas Diekmann, Jonathan Warby, Thomas Unold, Felix Lang, Dieter Neher, Martin Stollerfoht<br>Revealing the Doping Density in Perovskite Solar Cells and Its Impact on Device Performance                                                                                                                                                           |
| 16:00 - 16:15<br>I-O3                                                        | <u>Kyle Frohna</u> ( <i>Cavendish Laboratory, University of Cambridge, Cambridge, UK</i> ), Miguel Anaya, Stuart Macpherson, Jooyoung Sung, Tiarnan A.S. Doherty, Yu-Hsien Chiang, Andrew J. Winchester, Kieran W.P. Orr, Julia E. Parker, Paul D. Quinn, Keshav M. Dani, Akshay Rao, Samuel D. Stranks<br>Nanoscale Chemical Landscape Dominates Optoelectronic Response in Alloyed Halide Perovskites                                                                                                                                                              |
| 16:15 - 16:30<br>I-O4                                                        | <u>Bowen Yang</u> ( <i>Department of Chemistry-Angstrom, Uppsala University</i> ), Jiajia Suo, Anders Hagfeldt<br>Interfacial Passivation Treatment towards High-efficiency and Operational Stable Perovskite Solar Cells                                                                                                                                                                                                                                                                                                                                            |
| 16:30 - 16:45<br>I-O5                                                        | <u>Ales Vlk</u> ( <i>Laboratory of Thin Films, Institute of Physics, ASCR, Cukrovarnická 10, 162 00 Prague, Czech Republic</i> ), Nada Mrkyvkova, Vladimir Held, Peter Nadazdy, Riyas Subair, Eva Majkova, Matej Jergel, Martin Ledinsky, Antonin Fejfar, Jianjun Tian, Peter Siffalovic<br>Defect Formation During the Halide Perovskite Growth: Timing is the Way to Effective Passivation                                                                                                                                                                         |
| 16:45 - 17:00<br>I-O6                                                        | <u>Alan Dunbar</u> ( <i>Chemical and Biological Engineering, The University of Sheffield</i> ), Kostas Tsevas, Maria Vasilopoulou, Mohammad Nazeeruddin, David Lidzey, Connie Rodenburg<br>The importance of lead iodide stoichiometry when preparing perovskite solar cells                                                                                                                                                                                                                                                                                         |
| <b>Session C1 - Perovskites Water</b><br>Chair: Francesca Brunetti           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 15:00 - 15:30<br>Water-IS1                                                   | Mohammad Ali Akhavan Kazemi, Nicolas Folastre, Parth Raval, Michel Sliwa, Olivier Lafon, Laurent Delevoye, Arash Jamali, G.N. Manjunatha Reddy, Arnaud Demortiere, <u>Frédéric Sauvage</u> ( <i>Laboratoire de Réactivité et Chimie des Solides (LRCS) UMR CNRS 7314 - Université de Picardie Jules Verne 33 rue Saint Leu, FR-80039 Amiens Cedex, France</i> )<br>Live Observations of Non-equilibrium Moisture-induced Phase Segregation in CsMAFA-type Perovskite Revealed by In situ X-ray Diffraction and Operando Liquid-cell Transmission Electron Microscopy |
| 15:30 - 15:45<br>Water-O1                                                    | <u>Manuel Vasquez-Montoya</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie</i> ), Eva Unger<br>Stabilization of halide perovskites in water solutions                                                                                                                                                                                                                                                                                                                                                                                                   |
| 15:45 - 16:00<br>Water-O2                                                    | <u>Cynthia Farha</u> ( <i>Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, 38000 Grenoble, France</i> ), Emilie Planes, Lara Perrin, David Martineau, Lionel Flandin<br>Complementary characterizations of 2d/3d perovskite Solar cells aged under damp heat conditions: Effect of the maturation process                                                                                                                                                                                                                                   |
| 16:00 - 16:15<br>Water-O3                                                    | <u>Andres F. Gualdrón-Reyes</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12071 Castelló de la Plana, Spain</i> ), Camilo A. Mesa, Sixto Giménez, Iván Mora Seró<br>Defect- and interfacial-engineering strategies to synthesize CsPbX <sub>3</sub> perovskite nanocrystals for efficient photo(electro)catalysis                                                                                                                                                                                                                            |
| 16:15 - 16:30<br>Water-O4                                                    | <u>Waldemar Kaiser</u> ( <i>Computational Laboratory for Hybrid/ Organic Photovoltaics (CLHYO), Istituto CNR di Scienze e Tecnologia Chimiche "Giulio Natta" (CNR-SCITEC)</i> ), Damiano Ricciarelli, Edoardo Mosconi, Asma A Allothman, Francesco Ambrosio, Filippo De Angelis<br>(In-)Stability of Tin Halide Perovskites: Ab Initio Molecular Dynamics Simulations of Perovskite/Water Interfaces                                                                                                                                                                 |
| 16:30 - 16:45<br>Water-O5                                                    | <u>Juanita Hidalgo</u> ( <i>School of Materials Science and Engineering, Georgia Institute of Technology</i> ), Juan-Pablo Correa-Baena, Yu An, Susan Schorr, Joachim Breternitz<br>Water and oxygen induce undesired phase transitions in cesium-formamidinium lead halide perovskites                                                                                                                                                                                                                                                                              |
| 16:45 - 17:00<br>Water-O6                                                    | <u>Osbel Almora</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> ), Gebhard J. Matt, Marisé García-Batlle, Germà García-Belmonte<br>Long term Surface and Bulk Currents with Space-Charge Effects in Lead Halide Perovskites                                                                                                                                                                                                                                                                    |
| <b>Session D1 - Organic Semiconductor Physics</b><br>Chair: Emilio Palomares |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 15:00 - 15:30<br>Physics-IS1                                                 | <u>Akshay Rao</u> ( <i>Cavendish Laboratory University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK</i> )<br>Singlet Fission Enhanced Inorganic Photovoltaics                                                                                                                                                                                                                                                                                                                                                                                              |
| 15:30 - 15:45<br>Physics-O1                                                  | <u>Cleber Marchiori</u> ( <i>Department of Engineering and Physics, Karlstad University, SE-65188 Karlstad, Sweden</i> ), Leandro Franco, Ellen Moons, C. Moyses Araujo<br>Thermodynamics aspects of charge transfer processes in organic photovoltaics materials: Insights from atomic scale modelling                                                                                                                                                                                                                                                              |
| 15:45 - 16:00<br>Physics-O2                                                  | <u>Marios Maimaris</u> ( <i>Department of Chemistry, Imperial College London, London W12 0BZ, UK</i> ), Allan J. Pettipther, Mohammed Azzouzi, Daniel J. Walke, Xijia Zheng, Andrei Gorodetsky, Yifan Dong, Pabitra Shakya Tuladhar, Helder Crespo, Jenny Nelson, John W. G. Tisch, Artem A. Bakulin<br>How Fast Can Bound Exciton Formation Be? Sub-10-fs!                                                                                                                                                                                                          |
| 16:00 - 16:15<br>Physics-O3                                                  | <u>Vishal Bechaj</u> ( <i>High Field Magnet Laboratory, HFML-EMFL, Radboud University, The Netherlands</i> ), Koen van den Hoven, Peter Christianen, Hans Engelkamp<br>Direct Observation of Exchange-Coupled Triplet-Pair Emission in TIPS-Tetracene Crystals                                                                                                                                                                                                                                                                                                       |
| 16:15 - 16:30<br>Physics-O4                                                  | <u>Paula Hartnagel</u> ( <i>Institut für Energie und Klimaforschung (IEK-5), Forschungszentrum Jülich GmbH, D-52425 Jülich, Deutschland</i> ), Benjamin Klingebiel, Oliver Thimm, Thomas Kirchartz<br>Comparing Methods of Characterizing Energetic Disorder in Organic Solar Cells                                                                                                                                                                                                                                                                                  |
| 16:30 - 16:45<br>Physics-O5                                                  | <u>Dmitry Maslennikov</u> ( <i>Imperial College London, Chemistry Department, UK</i> ), Marios Maimaris, Navendu Mondal, Haoqing Ning, Shawn Zheng, Yifan Dong, Vitaly Podzorov, Vladimir Bruevich, Artem Bakulin<br>Singlet fission dynamics in high quality rubrene single crystals                                                                                                                                                                                                                                                                                |
| 16:45 - 17:00<br>Physics-O6                                                  | <u>David Francisco Macías Pinilla</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Av. Sos Baynat s/n, 12071 Castelló, Spain</i> ), Josep Planelles, Iván Mora Seró, Juan I. Clemente<br>Excitons, Trions and Biexcitons in Colloidal Nanoplatelets: The Influence of the Dielectric Environment                                                                                                                                                                                                                                                |
| <b>Session E1 - Structure</b><br>Chair: Sanjay Mathur                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| 15:00 - 15:30<br>Structure-IS1 | <u>jacky even</u> ( <i>Univ Rennes, INSA Rennes, CNRS, Institut FOTON (Fonctions Optiques pour les Technologies de l'information) - UMR 6082, F-35000 Rennes, France</i> ), siraj sidhik, wenbin li, hao zhang, boubacar traoré, claudio quarti, alia Skorokhod, nicolas mercier, wei li, mercouri kanatzidis, jean-christophe blancon, aditya mohite, claudine katan<br>Influence of Chemical Engineering, Photodoping and Lattice Distortions on the Optoelectronic Properties of Multilayered Perovskites             |
| 15:30 - 15:45<br>Structure-O1  | <u>Klara Suchan</u> ( <i>Chemical Physics and Nano Lund, Lund University, P.O. Box 124, Lund 22100, Sweden</i> ), Justus Just, Pascal Becker, Carolin Rehermann, Aboma Merdasa, Roland Mainz, Ivan G. Scheblykin, Eva L. Unger<br>Two Step Phase-Segregation Process Revealed in Mixed Halide MHPs by Simultaneous In-Situ X-ray Diffraction and Photoluminescence Spectroscopy.                                                                                                                                         |
| 15:45 - 16:00<br>Structure-O2  | <u>Tiarnan Doherty</u> ( <i>Department of Chemical Engineering and Biotechnology, University of Cambridge; Cambridge, UK</i> ), Satyawan Nagane, Dominik Kubicki, Young-Kwang Jung, Duncan Johnstone, Affan Iqbal, Dengyang Guo, Kyle Frohna, Mohsen Danaie, Elizabeth Tennyson, Stuart Macpherson, Anna Abfalterer, Miguel Anaya, Yu-Hsien Chiang, Phillip Crout, Francesco Simone Ruggeri, Sean Collins, Clare Grey, Aron Walsh, Paul Midgley, Samuel Stranks<br>Tilted-octahedra stabilize FA rich halide perovskites |
| 16:00 - 16:15<br>Structure-O3  | <u>Rebecca Belisle</u> ( <i>Department of Physics, Wellesley College</i> )<br>Structural Observations of Carrier Induced Degradation in Mixed-Halide Perovskites                                                                                                                                                                                                                                                                                                                                                         |
| 16:15 - 16:30<br>Structure-O4  | <u>David Otto Tiede</u> ( <i>Institute of Materials Science of Seville, (Spanish National Research Council (CSIC) - Univ. Seville), Seville, Spain</i> ), Juan F. Galisteo-López, Mauricio E. Calvo, Hernán Miguez<br>Iodide Nanodomain Formation as Local Rearrangement Process during Phase Segregation in Mixed Halide Perovskites                                                                                                                                                                                    |
| 16:30 - 16:45<br>Structure-O5  | <u>Silvia Ferro</u> ( <i>AMOLF</i> )<br>Pressure-induced bandgap shift and phase transition in 2D perovskites with varying organic spacers                                                                                                                                                                                                                                                                                                                                                                               |
| 16:45 - 17:00<br>Structure-O6  | <u>Susana Ramos Terrón</u> ( <i>Department of Physical Chemistry and Applied Thermodynamics, University of Cordoba, Spain</i> ), Cristóbal Verdugo Escamilla, Luis Camacho Delgado, Gustavo de Miguel Rojas<br>A-site Cation Engineering in Two-Dimensional Hybrid Perovskites                                                                                                                                                                                                                                           |
| 17:15 - 20:00                  | <b>Poster Session</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| May 24th - Day 6 (Tuesday) 6 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| 08:55 - 09:00                | <b>Announcement of the day</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                              | <b>Keynote</b><br>Chair: Elizabeth Gibson                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 09:00 - 09:45<br>Keynote-K1  | <u>Jenny Nelson</u> ( <i>Imperial College London, Physics Department and Center for Processable Electronics</i> )<br>Luminescence and molecular modelling as tools to probe structure-property-performance relationships at molecular heterojunctions                                                                                                                                                                                                                                                       |
|                              | <b>Session G2.1</b><br>Chair: Elizabeth Gibson                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 09:45 - 10:15<br>G2.1-I1     | <u>Marina Freitag</u> ( <i>Newcastle University</i> )<br>Zombie Solar Cells for Ambient Applications                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10:15 - 10:45<br>G2.1-I2     | <u>Francesca Brunetti</u> ( <i>CHOSE, Department of Electronic Engineering, University of Rome Tor Vergata, via del Politecnico 1, 00133 Rome, Italy</i> ), Francesca De Rossi, Matteo Bonomo, Babak Taheri, Giacomo Renno, Vishal Gupta, Narghes Yaghoobi Nia, Paolo Rech, Chris Frost, Carlo Cazzaniga, Pierluigi Quagliotto, Aldo Di Carlo, Marco Ottavi, Claudia Barolo<br>Perovskite films and solar cells on PET substrates for space applications: stability study under neutron irradiation         |
| 10:45 - 11:15                | <b>Coffee Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                              | <b>Session G2.2</b><br>Chair: Jenny Nelson                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11:15 - 11:45<br>G2.2-I1     | <u>Peter Holliman</u> ( <i>College of Engineering, Bay Campus, Swansea University, Swansea, SA1 8EN, UK</i> ), Christopher Kershaw, Diana Meza-Rojas, Eurig Jones, Anthony Lewis, Dawn Geatches, Kakali Sen, Ya-Wen Hsiao<br>Linking theory and experiment to surface engineer environmentally sustainable solar cells                                                                                                                                                                                      |
| 11:45 - 12:15<br>G2.2-I2     | <u>Bruno Ehrler</u> ( <i>Center for Nanophotonics, AMOLF, Amsterdam, The Netherlands</i> )<br>The Effect of Strain on Ion Migration in Metal Halide Perovskites                                                                                                                                                                                                                                                                                                                                             |
| 12:15 - 12:20                | <b>Sciprios GmbH - Industrial talk</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                              | <b>Session G2.3</b><br>Chair: Jenny Nelson                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 12:20 - 12:50<br>G2.3-I1     | <u>Alexander Urban</u> ( <i>Ludwig Maximilians University (LMU) Munich</i> )<br>Halide Perovskite Nanoplatelets: Fundamentals for Optoelectronics                                                                                                                                                                                                                                                                                                                                                           |
| 12:50 - 13:20<br>G2.3-I2     | <u>Sanjay Mathur</u> ( <i>Department for Chemistry, Institute of Inorganic Chemistry, University of Cologne</i> ), Feray Uenlue<br>Chemical engineering of lead halide perovskites: from precursor inks to perovskite nanofibers                                                                                                                                                                                                                                                                            |
| 13:20 - 15:00                | <b>Lunch Break</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                              | <b>Session A2 - Interfaces I &amp; Manufacturing II</b><br>Chair: Iván Mora-Seró                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15:00 - 15:15<br>II-01       | <u>Mahmoud Zendehele</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome Tor Vergata, Roma 00133, Italy</i> ), Narges Yaghoobi Nia, Barbara Paci, Marco Di Giovannantonio, Amanda Generosi, Enrico Leonardi, Giorgio Contini, Marco Guaragno, Aldo Di Carlo<br>Toward Highly Stable and Scalable Perovskite Solar Modules via Co-crystalline 2D Perovskite Passivation and Blade-Spin Deposition                                          |
| 15:15 - 15:30<br>II-02       | <u>Rafael S. Sánchez</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> ), Jesús Sánchez-Díaz, Sofia Masi, Marie Krečmarová, Agustín O. Alvarez, Eva M. Barea, Jesús Rodríguez-Romero, Vladimir S. Chirvony, Juan F. Sánchez-Royo, Juan P. Martínez-Pastor, Iván Mora-Sero<br>Synergistic Additive's Engineering and Mechanistic Photo-Electrochemical Insights for the Development of High-Performance Tin-based Perovskite Solar Cells |
| 15:30 - 15:45<br>II-03       | <u>Namrata Pant</u> ( <i>School of Chemistry, University of Glasgow, University Pl, G12 8QQ, Glasgow, UK</i> ), Michele Cariello, Alexander Harkiss, Frances Tracey, Joseph Cameron, Peter Skabara, Peter Holliman, Pablo Docampo, Graeme Cooke<br>Synthesis of SOT-OH as a building block for the synthesis of new dimeric and trimeric Spiro-OMeTAD Materials                                                                                                                                             |
| 15:45 - 16:00<br>II-04       | <u>Mayank Kedia</u> ( <i>Institut für Photovoltaik (ipv), Universität Stuttgart, Pfaffenwaldring 47, D-70569 Stuttgart, Deutschland</i> ), Michael Saliba<br>Interface Engineering of Perovskite via Laser Polishing                                                                                                                                                                                                                                                                                        |
| 16:00 - 16:15<br>II-05       | <u>Sandy Sanchez</u> ( <i>EPFL, Switzerland</i> )<br>Thermally Controlled Growth of photoactive FAPbI <sub>3</sub> films for Highly Stable Perovskite Solar Cells                                                                                                                                                                                                                                                                                                                                           |
| 16:15 - 16:30<br>II-06       | <u>Maurizio Stefanelli</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome "Tor Vergata", via del Politecnico 1, 00133 Rome, Italy</i> ), Luigi Vesce, Luigi Angelo Castriotta, Francesco Di Giacomo, Aldo Di Carlo<br>Perovskite Technology Scaling Up From 32 cm <sup>2</sup> to 320 cm <sup>2</sup> Module by Fully Ambient Air Meniscus Coating Processes                                                                             |
| 16:30 - 16:45<br>II-07       | <u>Monika Rai</u> ( <i>Institute for Photovoltaics (ipv), University of Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany</i> ), Zhengtian Yuan, Anupam Sadhu, Shin Woei Leow, Lioz Etgar, Shlomo Magdassi, Lydia Helena Wong<br>Holistic Approach Towards Fully Semi-transparent 21 cm <sup>2</sup> Perovskite Solar Module with 9.5% Efficiency                                                                                                                                                     |
| 16:45 - 17:00<br>II-08       | <u>Joe Briscoe</u> ( <i>School of Engineering and Materials Science, Queen Mary University of London.</i> )<br>Additive-Enhanced Aerosol Treatment for Improved Perovskite Solar Cells and Photodetectors                                                                                                                                                                                                                                                                                                   |
| 17:00 - 17:15<br>II-09       | <u>Javier Castillo-Seoane</u> ( <i>Institute of Materials Science of Seville, (Spanish National Research Council (CSIC) - Univ. Seville), Seville, Spain</i> ), Lidia Contreras-Bernal, Jose Manuel Obrero-Pérez, Xabier García-Casas, Francisco J Aparicio, M Carmen López-Santos, T Cristina Rojas, Juan A Anta, Ana Borrás, Ángel Barranco, Juan Ramón Sánchez-Valencia<br>Two Step Glancing Angle Deposition of Supported Vertically Aligned Organometallic Halide Perovskite Nanostructures            |
|                              | <b>Session B2 - Defects II &amp; Interfaces II</b><br>Chair: Bruno Ehrler                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 15:00 - 15:15<br>II-01       | <u>Sofia Kosar</u> ( <i>Femtosecond Spectroscopy Unit, Okinawa Institute of Science and Technology Graduate University, Onna, Okinawa, 904 0495, Japan</i> ), Andrew J. Winchester, Tiarnan A. S. Doherty, Stuart Macpherson, Christopher E. Petoukhoff, Kyle Frohna, Miguel Anaya, Nicholas S. Chan, Julien Madéo, Michael K. L. Man, Samuel D. Stranks, Keshav M. Dani<br>The varied nature and roles of nanoscale defects in solution processed triple cation mixed halide perovskite thin films         |

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| 15:15 - 15:30<br>II-02                                                               | <u>Waqas Zia</u> ( <i>Institut für Photovoltaik (ipv), Universität Stuttgart, Pfaffenwaldring 47, D-70569 Stuttgart, Deutschland</i> ), Clara A. Aranda, Michael Saliba<br>Unveiling the Optoelectronic Properties of Seeded vs Unseeded grown MAPbBr <sub>3</sub> Perovskite Single Crystals                                                                                                                                                                                                                         |
| 15:30 - 15:45<br>II-03                                                               | <u>Suleiman Bello</u> ( <i>University of Sheffield, Department of Chemical and Biological Engineering</i> ), Alisyn Nedoma, Alan Dunbar<br>Zinc chloride as a performance-enhancing additive for MAPbI <sub>3</sub> solar cells produced in air.                                                                                                                                                                                                                                                                      |
| 15:45 - 16:00<br>II-04                                                               | <u>Kasparas Rakstys</u> ( <i>Department of Organic Chemistry, Kaunas University of Technology, Lithuania</i> )<br>Interfacial material engineering for the perovskite solar cell stability improvement                                                                                                                                                                                                                                                                                                                |
| 16:00 - 16:15<br>II-05                                                               | <u>Daimiota Takhellambam</u> ( <i>CHOSE- Center for Hybrid and Organic Solar Energy, Electronic Engineering Department, University of Rome Tor Vergata</i> ), Luigi Angelo Castriotta, Gloria Zanotti, Laura Mancini, Aldo di Carlo<br>Introducing Organic Interlayer over Self Assembled Monolayers: Boosting Stability of Solution Processable P-I-N based Perovskite Solar Cells with nearly 20% efficiency                                                                                                        |
| 16:15 - 16:30<br>II-06                                                               | <u>Anjana Wijesekara</u> ( <i>Department of Chemistry, University of Warwick, Coventry, CV4 7AL, United Kingdom</i> ), Marc Walker, Yisong Han, David Walker, Steven Huband, Ross Hatton<br>Enhanced Stability of Tin Halide Perovskite Photovoltaics Using a Bathocuproine - Copper Top Electrode                                                                                                                                                                                                                    |
| 16:30 - 16:45<br>II-07                                                               | <u>Karunanantharajah Prashanthan</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, 14109 Berlin, Germany</i> ), Igal Levine, Emilio Gutierrez-Partida, Artem Musienko, Hannes Hempel, Klaus Lips, Thomas Unold, Martin Stolterfoht, Thomas Dittrich, Rowan W. MacQueen<br>Carrier Dynamics in Upconverting Thin Film Perovskite/Rubrene Bilayers Studied by Combined Surface Photovoltage and Photoluminescence                                                                                     |
| 16:45 - 17:00<br>II-08                                                               | <u>ALANOOD ALIAGHWANI</u> ( <i>Department of Chemistry, University of Warwick, CV4 7AL, Coventry, United Kingdom</i> ), Philip Bellchambers, yisong Han, Ross Hatton<br>A microcontact printed tin passivated copper grid electrode for organic photovoltaics                                                                                                                                                                                                                                                         |
| 17:00 - 17:15<br>II-09                                                               | <u>Christopher Petoukhoff</u> ( <i>Rutgers University, Materials Science and Engineering, US</i> ), Deirdre O'Carroll<br>Optimization of PCDTBT Metal-Insulator-Metal Hole-Only Photodiodes                                                                                                                                                                                                                                                                                                                           |
| <b>Session C2 - Manufacturing I &amp; New Materials II</b><br>Chair: Gerrit Boschloo |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 15:00 - 15:15<br>II-01                                                               | <u>Konrad Wojciechowski</u> ( <i>Saule Research Institute</i> )<br>Perovskite photovoltaic technology on flexible substrates                                                                                                                                                                                                                                                                                                                                                                                          |
| 15:15 - 15:30<br>II-02                                                               | <u>Jaume Noguera-Gómez</u> ( <i>UMDO Institut de Ciència dels Materials (ICMUV), Universitat de València</i> ), Ismael Fernández-Guillen, Pablo Franco Betancur, Pablo P. Boix, Rafael Abarques<br>Low-demanding in-situ crystallization method for tunable and stable perovskite nanoparticle thin-films.                                                                                                                                                                                                            |
| 15:30 - 15:45<br>II-03                                                               | <u>Michele Sessolo</u> ( <i>Universidad de Valencia - ICMol (Institute of Molecular Science)</i> ), Lidón Gil-Escrig, Isidora Susic, Henk Bolink<br>Vacuum Deposition of Multi-Component Perovskite Solar cells                                                                                                                                                                                                                                                                                                       |
| 15:45 - 16:00<br>II-04                                                               | <u>Valentina M. Caselli</u> ( <i>Department of Chemical Engineering, Delft University of Technology (TU Delft), The Netherlands</i> ), Jos Thieme, Job Hermans, Sohan A. Phadke, Huygen J. Jöbsis, Eline M. Hutter, Tom J. Savenije<br>Towards Lead-Free Perovskite: How Excitons and Charge Carriers Contribute to the Photovoltaic Performance in Cs <sub>2</sub> AgBiBr <sub>6</sub> Solar Cells                                                                                                                   |
| 16:00 - 16:15<br>II-05                                                               | <u>Carlos Echeverría-Arrondo</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> ), Iván Mora-Seró<br>A picture on DFT calculations for perovskite materials                                                                                                                                                                                                                                                                                        |
| 16:15 - 16:30<br>II-06                                                               | <u>Florian Wolf</u> ( <i>University of Munich (LMU), Department of Chemistry and Center for Nanoscience (CeNS)</i> ), Rik Hooijer, Melina Armer, Firouzeh Ebadi, Mahdi Mohammadi, Clement Maheu, Andreas Weis, Bas T. van Gorkom, Sebastian Häring, Rene A. J. Janssen, Thomas Mayer, Vladimir Dyakonov, Wolfgang Tress, Thomas Bein<br>2D/3D Hybrid Cs <sub>2</sub> AgBiBr <sub>6</sub> Double Perovskite Solar Cells: Improved Energy Level Alignment for Higher Contact-Selectivity and Large Open Circuit Voltage |
| 16:30 - 16:45<br>II-07                                                               | <u>Zafar Iqbal</u> ( <i>Department Novel Materials and Interfaces for Photovoltaic Solar Cells, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany</i> ), Antonio Abate, Qiong Wang<br>CsPbI <sub>3</sub> /Hole transport layer interface modified by dipole molecule leads to better charge extraction and stability                                                                                                                                                                         |
| 16:45 - 17:00<br>II-08                                                               | <u>Alessandra Alberti</u> ( <i>Institute for Microelectronics and Microsystems (CNR-IMM), Zona Industriale - VIII Strada 5, Catania 95121, Italy</i> ), Emanuele Smecca, Ioannis Deretzis, Giovanni Mannino, Corrado Bongiorno, Salvatore Valastro, Salvatore Sanzaro, Giuseppe Fisicaro, Ajay Kumar Jena, Youhei Numata, Zhanglin Guo, Tsutomu Miyasaka, Corrado Spinella, Antonino La Magna<br>Beneficial role of Europium into CsPbI <sub>3</sub> perovskites                                                      |
| 17:00 - 17:15<br>II-09                                                               | <u>Mahdi Malekshahi Byravanand</u> ( <i>Institute for Photovoltaics (ipv), Universität Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany</i> ), Tim Kodalle, Weiwei Zuo, Theresa Magorian Friedlmeier, Maged Abdelsamie, Kootak Hong, Waqas Zia, Shama Perween, Oliver Clemens, Carolin M. Sutter-Fella, Michael Saliba<br>One-Step Thermal Gradient-Free Crystallization method for Highly Efficient and Thermally Stable All-Inorganic Perovskite Solar Cells                                                 |
| <b>Session D2 - New Materials I &amp; Sustainability</b><br>Chair: Peter Holliman    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 15:00 - 15:15<br>Sustainability-01                                                   | <u>Rik Hooijer</u> ( <i>University of Munich (LMU), Department of Chemistry and Center for Nanoscience (CeNS)</i> ), Andreas Weis, Alexander Biewald, Maximilian T. Sirtl, Julian Malburg, Rico Holfeuer, Simon Thamm, Amir Abbas Yousefi Amin, Marcello Righetto, Achim Hartschuh, Laura M. Herz, Thomas Bein<br>Silver-Bismuth based 2D Double Perovskites (4FPEA)AgBiX <sub>8</sub> (X=Cl, Br, I): Highly Oriented Thin Films with Large Domain Sizes and Ultrafast Charge-Carrier Localization                    |
| 15:15 - 15:30<br>Sustainability-02                                                   | <u>Yongjie Wang</u> ( <i>ICFO-Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, 08860 Castelldefels (Barcelona), Spain</i> ), Sean Kavanagh, Ignasi Burgués-Ceballos, Aron Walsh, David Scanlon, Gerasimos Konstantatos<br>Efficient AgBiS <sub>2</sub> Nanocrystal Solar Cells enabled by Cation Disorder Engineering                                                                                                                                                              |
| 15:30 - 15:45<br>Sustainability-03                                                   | <u>Fabian Schmitz</u> ( <i>Center for Materials Research, Justus Liebig University, Heinrich-Buff-Ring 17, 35392, Giessen, Germany</i> ), Teresa Gatti<br>High Open-Circuit Voltage Cs <sub>2</sub> AgBiBr <sub>6</sub> Carbon-Based Perovskite Solar Cells Via Green Processing of Ultrasonic Spray-Coated Carbon Electrodes from Waste Tire Sources                                                                                                                                                                 |
| 15:45 - 16:00<br>Sustainability-04                                                   | <u>Nathan Daem</u> ( <i>University of Liege, GREENMAT</i> ), Jennifer Dewalque, Felix Lang, Anthony Maho, Gilles Spronck, Catherine Henrist, Pierre Colson, Samuel D. Stranks, Rudi Cloots<br>High Open-Circuit Voltage Lead-Free Cs <sub>2</sub> AgBiBr <sub>6</sub> Double Perovskite Solar Cells from Spray-Coating Deposition                                                                                                                                                                                     |

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| 16:00 - 16:15<br>Sustainability-05                                   | <u>Dmitry Bogachuk</u> ( <i>Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, 79110 Freiburg, Germany</i> ), Peter van der Windt, David Martineau, Stephanie Narbey, Anand Verma, Salma Zouhair, Andreas Hinsch, Markus Kohlstädt, Lukas Wagner<br>A novel recycling method for encapsulated perovskite mesoscopic photovoltaic devices with minimal performance loss                                                                                                                      |
| 16:15 - 16:30<br>Sustainability-06                                   | <u>Abhyuday Paliwal</u> ( <i>Universidad de Valencia - ICMol (Institute of Molecular Science)</i> ), Henk Bolink<br>Efficient All Vacuum Deposited Perovskite Solar Cells in Substrate Configuration                                                                                                                                                                                                                                                                                                            |
| 16:30 - 16:45<br>Sustainability-07                                   | <u>Mark Khenkin</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany</i> ), Quiterie Emery, Marko Remec, Ulas Erdil, Hans Köbler, Jinzhao Li, Antonio Abate, Eva Unger, Rutger Schlatmann, Carolin Ulbrich<br>Perovskite Solar Cells in Real-World Conditions: What Did We Learn from Outdoor Experiments So Far?                                                                                                                                                                     |
| 16:45 - 17:00<br>Sustainability-08                                   | <u>Nilanka Monarawila Keppetipola</u> ( <i>Univ. Bordeaux, CNRS, Bordeaux INP, ISM, UMR 5255, 351 Cours de la Libération, F-33405 Talence, Cédex</i> ), G.R.A Kumara, Kirithi Tennakone, Marie-Anne Dourges, Céline Olivier, Thierry Toupance, Ludmila Cojocaru<br>Sustainable photo-supercapacitors using biomass waste as source of carbon for electrodes                                                                                                                                                     |
| 17:00 - 17:15<br>Sustainability-09                                   | <u>CARYS WORSLEY</u> ( <i>SPECIFIC - Swansea University Bay Campus, Fabian Way, Crymlyn Burrows, SA1 8EN Swansea</i> )<br>Green solvent engineering for enhanced performance and reproducibility in printed carbon-based mesoscopic perovskite solar cells and modules                                                                                                                                                                                                                                          |
| <b>Session E2 - Tandems I &amp; Tandems II</b><br>Chair: Henk Bolink |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 15:00 - 15:15<br>II-01                                               | <u>Mehrdad Najafi</u> ( <i>TNO, partner in Solliance, High Tech Campus 21, 5656 AE Eindhoven, The Netherlands</i> ), Dong Zhang, Valerio Zardetto, Lukas Simurka, Wiljan Verhees, Henri Fledderus, Harrie Gorter, Giulia Lucarelli, Ilker Dogan, Klaas Bakker, Petra Manshanden, Afshin Hadipour, Stijn Lammar, Mirjam Theelen, Rene Janssen, Tom Aernouts, Arthur Weeber, Bart Geerligs, Gianluca Coletti, Sjoerd Veenstra<br>Highly Efficient Perovskite/Silicon Four-Terminal Tandem Solar Cells and Modules |
| 15:15 - 15:30<br>II-02                                               | <u>Vivek Babu</u> ( <i>Saule Technologies, Wrocław Technology Park, 11 Dunska, Wrocław, 54-427, Poland</i> ), Mario Alejandro Mejia Escobar, Rosinda Fuentes Pineda, Mateusz Scigaj, Pierpaolo Spinelli, Konrad Wojciechowski<br>Towards up-scaling the 4-terminal all-perovskite tandem solar modules on flexible substrates                                                                                                                                                                                   |
| 15:30 - 15:45<br>II-03                                               | <u>Narges Yaghoobi Nia</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome Tor Vergata, Roma 00133, Italy</i> ), Mahmoud Zendehele, Harshavardhan Reddy Sathy, Luigi Schirone, Aldo Di Carlo<br>Super Stable Semitransparent Perovskite Solar Modules for 4-terminal Perovskite-Silicon Tandem Modules via Engineering of the Polymeric Hole Transport Layer and Surface Passivation                                                          |
| 15:45 - 16:00<br>II-04                                               | <u>Philipp Tockhorn</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie, Division Solar Energy, Kekuléstr. 5, 12489 Berlin, Germany</i> ), Johannes Sutter, Alexandros Cruz Bournazou, Klaus Jäger, Felix Lang, Max Grischek, Philipp Wagner, Danbi Yoo, Martin Stalterfoht, Bernd Stannowski, Steve Albrecht, Christiane Becker<br>Nanostructures Enable Certified Efficiency of 29.80% in Perovskite/Silicon Tandem Solar Cells                                                                     |
| 16:00 - 16:15<br>II-05                                               | <u>Yu-Hsien Chiang</u> ( <i>Department of Physics, Cavendish Laboratory, University of Cambridge; Cambridge, UK</i> ), Miguel Anaya, Kyle Frohna, Hayden Salway, Sam Stranks<br>Selective contact, bandgap and passivation engineering in vacuum deposited perovskites for tandem solar cells                                                                                                                                                                                                                   |
| 16:15 - 16:30<br>II-06                                               | <u>Marcel Roß</u> ( <i>Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany</i> ), Stefanie Severin, Amran Al-Ashouri, Eike Köhnen, Philipp Tockhorn, Philipp Wagner, Jona Kurpiers, Bernd Stannowski, Steve Albrecht<br>Fully Textured Monolithic Perovskite/Silicon Tandem Solar Cells Realized by Co-Evaporation                                                                                                                                                                               |
| 16:30 - 16:45<br>II-07                                               | <u>Paul Fassl</u> ( <i>Light Technology Institute, Karlsruhe Institute of Technology, Engesserstrasse 13, 76131 Karlsruhe, Germany</i> ), Saba Gharibzadeh, Marco A. Ruiz-Preciado, Motiur Rahman Khan, Ahmed Farag, Somayeh Moghadamzadeh, Christoph Klein, Ihteaz M. Hossain, Roja Singh, Ulrich W. Paetzold<br>Interface Passivation Schemes for Highly Efficient Inverted Perovskite Solar Cells and Two-Terminal perovskite/c-Si and perovskite/Cl(G)S tandem solar cells                                  |
| 16:45 - 17:00<br>II-08                                               | <u>Fabrizio Gota</u> ( <i>Karlsruhe Institute of Technology</i> ), Raphael Schmager, Ahmed Farag, Ulrich Paetzold<br>Energy Yield Modelling of Textured Perovskite/Silicon Tandem Photovoltaics with Thick Perovskite Top Cells                                                                                                                                                                                                                                                                                 |
| 17:00 - 17:15<br>II-09                                               | <u>Patricia S. C. Schulze</u> ( <i>Fraunhofer Institute for Solar Energy Systems ISE, 79110 Freiburg, Germany</i> ), Özde Ş. Kabaklı, Minasadat Heydarian, Oussama Er-Raji, Maryamsadat Heydarian, Raphael Efinger, Oliver Schultz-Wittmann, Christoph Messmer, Alexander J. Bett, Oliver Fischer, Leonard Tutsch, Denis Erath, Sebastian Pingel, Thibaud Hatt, Martin Bivour, Jan Christoph Goldschmidt, Martin Hermle, Stefan W. Glunz<br>Monolithic 2-Terminal Perovskite Silicon Tandem Solar Cells         |
| 18:00 - 19:25                                                        | <b>Valencia guided Tour</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 20:00 - 22:00                                                        | <b>Social Dinner</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**May 25th - Day 7 (Wednesday) 7**

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| 08:55 - 09:00               | <b>Announcement of the day</b>                                                                                                                                                                                                                                                                                                                                                                                                    |
|                             | <b>Keynote</b><br>Chair: Eva Unger                                                                                                                                                                                                                                                                                                                                                                                                |
| 09:00 - 09:45<br>Keynote-K1 | <u>Christoph Brabec</u> ( <i>Institute of Materials for Electronics and Energy Technology (i-MEET), Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) &amp; Erlangen Graduate School in Advanced Optical Technologies (SAOT), FAU, Germany</i> )<br>Advanced Interface Engineering for Long Lived OPV and PSC                                                                                                               |
|                             | <b>Session G3</b><br>Chair: Eva Unger                                                                                                                                                                                                                                                                                                                                                                                             |
| 09:45 - 10:15<br>G3-I1      | <u>Maria Antonietta Loi</u> ( <i>Univeristy of Groningen</i> )<br>Scalable, Template Driven Formation of Highly Crystalline Lead-Tin Halide Perovskite Films                                                                                                                                                                                                                                                                      |
| 10:15 - 10:45<br>G3-I2      | <u>Thomas Kirchartz</u> ( <i>Forschungszentrum Jülich</i> )<br>Defect densities and charge carrier lifetimes in lead-halide perovskites                                                                                                                                                                                                                                                                                           |
| 10:45 - 11:15               | <b>Coffee Break</b>                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11:15 - 11:45<br>G3-I3      | <u>Juan Bisquert</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> )<br>Impedance spectroscopy and hysteresis effects of halide perovskite solar cells and memristors                                                                                                                                                                                         |
| 11:45 - 12:15<br>G3-I4      | <u>David Egger</u> ( <i>Department of Physics, Technical University Munich, Germany</i> )<br>Sub-unit-cell disorder and intensified band-to-band transitions in halide perovskites from first-principles                                                                                                                                                                                                                          |
| 12:15 - 12:45<br>G3-I5      | <u>Henk Bolink</u> ( <i>Instituto de Ciencia Molecular, Universidad de Valencia, C/ Catedrático J. Beltrán 2, 46980 Paterna (Valencia), Spain</i> )<br>Vapor phase deposited single junction and tandem perovskite solar cells                                                                                                                                                                                                    |
| 12:45 - 13:15<br>G3-I6      | <u>Udo Bach</u> ( <i>ARC Centre of Excellence in Exciton Science, Department of Chemical and Biological Engineering, Monash University, Clayton, VIC, Australia</i> ), Wenxin Mao<br>Light-Induced Phase Segregation in Single-Crystalline Mixed-Halide Perovskite Platelets                                                                                                                                                      |
| 13:15 - 15:00               | <b>Lunch break</b>                                                                                                                                                                                                                                                                                                                                                                                                                |
|                             | <b>Session A3 - Characterisation II</b><br>Chair: Alexander Urban                                                                                                                                                                                                                                                                                                                                                                 |
| 15:00 - 15:30<br>II-IS1     | <u>Rebecca Milot</u> ( <i>Department of Physics, University of Warwick</i> )<br>Optoelectronic Properties of Layered Metal Hybrid Perovskites                                                                                                                                                                                                                                                                                     |
| 15:30 - 15:45<br>II-O1      | <u>Alberto García-Fernandez</u> ( <i>Division of Applied Physical Chemistry, Department of Chemistry, KTH - Royal Institute of Technology.</i> ), Sebastian Svanström, Cody M. Sterling, Abhijeet Gangan, Axel Erbing, Chinnathambi Kamal, Tamara Sloboda, Birgit Kammlander, Gabriel J. Man, Håkan Rensmo, Michael Odellius, Ute B. Cappel<br>Core level and valence band analysis of in-situ cleaved perovskite single crystals |
| 15:45 - 16:00<br>II-O2      | <u>Weidong Xu</u> ( <i>Centre for Processable Electronics, Department of Chemistry, Imperial College London W12 0BZ, U.K.</i> ), Lucy Jessica Fiona Hart, Benjamin Moss, Thomas J. Macdonald, Richard Pacalaj, Pietro Caprioglio, Robert DJ Oliver, James R Durrant<br>Operando-photoluminescence spectroscopy for accessing radiative and non-radiative losses in perovskite solar cells                                         |
| 16:00 - 16:15<br>II-O3      | <u>Tom P.A. van der Pol</u> ( <i>Molecular Materials and Nanosystems and Institute of Complex Molecular Systems, Eindhoven University of Technology, Partner in Solliance, P.O. Box 513, Eindhoven, 5600 MB, The Netherlands</i> ), Kunal Datta, Martijn M. Wienk, René A. J. Janssen<br>The Intrinsic Photoluminescence Spectrum of Perovskite Films                                                                             |
| 16:15 - 16:30<br>II-O4      | <u>Agustín O. Alvarez</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12071 Castelló de la Plana, Spain</i> ), Sandheep Ravishankar, Elena Más Marza, Francisco Fabregat-Santiago<br>Improving optoelectronic characterization by combining modulated techniques                                                                                                                                            |
| 16:30 - 16:45<br>II-O5      | <u>Ben Carwithen</u> ( <i>Department of Chemistry, Imperial College London, White City Campus, London, W12 0BZ, UK</i> ), Thomas Hopper, Ziyuan Ge, Navendu Mondal, Franziska Krieg, Federico Montanarella, Georgian Nedelcu, Martin Kroll, Karl Leo, Yana Vaynzof, Maryna Bodnarchuk, Maksym Kovalenko, Artem Bakulin<br>Hot Carrier Cooling Dynamics in Lead Halide Perovskite Nanomaterials                                    |
| 16:45 - 17:00<br>II-O6      | <u>Jake D. Hutchinson</u> ( <i>Department of Physics, University of Warwick, CV4 7AL, Coventry, United Kingdom</i> ), Edoardo Ruggeri, Jack M. Woolley, Samuel D. Stranks, Rebecca L. Milot<br>Ultrafast Photoexcited Carrier Dynamics in 2D/3D Lead-Tin Perovskites with Tuneable Dimensionality                                                                                                                                 |
| 17:00 - 17:15<br>II-O7      | <u>Salim Mejaouri</u> ( <i>IPVF, Institut Photovoltaïque d'Ile-de-France, 18 Boulevard Thomas Gobert, 91120 Palaiseau, France</i> ), Stéfania Cacovich, Iwan Zimmermann, Armelle Yaiche, Dominique Loinsard, Stéphane Collin, Jean Rousset<br>Analysis of the degradation products of hybrid perovskite by correlative electron microscopy                                                                                        |
|                             | <b>Session B3 - Manufacturing III</b><br>Chair: Udo Bach                                                                                                                                                                                                                                                                                                                                                                          |
| 15:00 - 15:30<br>III-IS1    | <u>Gerrit Boschloo</u> ( <i>Department of Chemistry - Ångström Laboratory, Uppsala University, Sweden</i> )<br>PIN and NIP Join Forces in a New Type of Perovskite Solar Cell Module                                                                                                                                                                                                                                              |
| 15:30 - 15:45<br>III-O1     | <u>Tian Du</u> ( <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Institute Materials for Electronics and Energy Technology, Department of Materials Science and Engineering, Energy Campus Nürnberg</i> )<br>Additive-free, Low-temperature Crystallization of Stable $\alpha$ -FAPbI <sub>3</sub> Perovskite                                                                                                               |
| 15:45 - 16:00<br>III-O2     | <u>Cristina Teixeira</u> ( <i>Saule Technologies Ltd., Dunska11, Wrocław 54-427, Poland</i> ), Pierpaolo Spinelli, Luigi Angelo Castriotta, Luísa Andrade, Dávid Forgács, Adélio Mendes, Aldo Di Carlo, Konrad Wojciechowski<br>Flexible Perovskite Solar Cells for indoor photovoltaics with efficiency up to 31% using metal and carbon electrodes                                                                              |
| 16:00 - 16:15<br>III-O3     | <u>Fabio Matteocci</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome "Tor Vergata", via del Politecnico 1, 00133 Rome, Italy</i> ), Jessica Barichello, Diego Di Girolamo, Elisa Nonni, Aldo Di Carlo<br>Opportunities of wide band gap semi-transparent perovskite solar cells and modules in BIPV                                                           |
| 16:15 - 16:30<br>III-O4     | <u>Farshad Jafarzadeh</u> ( <i>CHOSE (Centre for Hybrid and Organic Solar Energy), Department of Electronic Engineering, University of Rome Tor Vergata, Roma 00133, Italy</i> ), Luigi Angelo Castriotta, Francesca De Rossi, Aldo Di Carlo, Fabio Matteocci, Francesca Brunetti<br>Flexible Blade-coated Perovskite Solar Cells with a Non-hazardous Solvent System Fabricated in Ambient Air                                   |

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| 16:30 - 16:45<br>III-O5                                            | <u>Suer Zhou</u> ( <i>University of Oxford, Department of Physics, Clarendon Laboratory, UK</i> ), Maryte Daskeviciene, Matas Steponaitis, Giedre Bubniene, Vyngintas Jankauskas, Kelly Schutt, Philippe Holzhey, Ashley Marshall, Pietro Caprioglio, Grey Christoforo, James Ball, Tadas Malinauskas, Vytautas Getautis, Henry Snaith<br>Improving n-i-p Perovskite Solar Cells Stability through Transport Layers                                                              |
| 16:45 - 17:00<br>III-O6                                            | <u>Jacob Vagott</u> ( <i>School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA</i> ), Carlo Perini, Andres Felipe Castro Mendez, Juanita Hidalgo, Kathryn Bairley, Juan-Pablo Correa-Baena<br>PbI <sub>2</sub> and Lead Halide Perovskites by Atomic Layer Deposition for Perovskite Solar Cells                                                                                                                             |
| 17:00 - 17:15<br>III-O7                                            | <u>Miguel Casademont-Viñas</u> ( <i>Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Spain</i> ), Martí Gibert-Roca, Quan Liu, Koen Vandewal, Alejandro R. Goñi, Mariano Campoy-Quiles<br>Spectral Splitting Geometries for High Efficiency Multijunction Organic Solar Cells                                                                                                                                                                                         |
| <b>Session C3 - Modelling</b><br>Chair: Petra Cameron              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 15:00 - 15:30<br>Modelling-IS1                                     | <u>Alison Walker</u> ( <i>Department of Physics, University of Bath</i> ), Thijs Smolders, Lewis Irvine, Matthew Wolf, Matthew Cowley, Petra Cameron, William Clarke, Giles Richardson<br>Multiscale Modelling of Perovskite Devices                                                                                                                                                                                                                                             |
| 15:30 - 15:45<br>Modelling-O1                                      | <u>Matthew Cowley</u> ( <i>Centre for Sustainable and Circular Technologies, University of Bath</i> ), William Clarke, Matthew Wolf, Giles Richardson, Alison Walker, Petra Cameron<br>What can J-V hysteresis tell us about defect mediated phenomena in perovskite based solar cells?                                                                                                                                                                                          |
| 15:45 - 16:00<br>Modelling-O2                                      | Camilla Vael, <u>Sandra Jenatsch</u> ( <i>Fluxim AG, 8400 Winterthur, Switzerland</i> ), Simon Züfle, Frank Nüesch, Beat Ruhstaller<br>Assessing the validity of analytical models to determine trap state parameters from thermally stimulated current responses by means of drift-diffusion simulations                                                                                                                                                                        |
| 16:00 - 16:15<br>Modelling-O3                                      | <u>Agustín Bou</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12071, Castelló de la Plana, Spain</i> ), Juan Bisquert<br>What Information Can Be Extracted from Light Modulated Techniques in Perovskite Solar Cells?                                                                                                                                                                                                                                     |
| 16:15 - 16:30<br>Modelling-O4                                      | <u>Emilio Gutiérrez-Partida</u> ( <i>Universität Potsdam, Soft Matter Physics, Karl-Liebknecht-Straße 24-25, 14476 Potsdam, Germany</i> )<br>Towards understanding the built-in-field in perovskite solar cells through layer by layer SPV measurements                                                                                                                                                                                                                          |
| 16:30 - 16:45<br>Modelling-O5                                      | Jose Obrero-Perez, <u>Lidia Contreras-Bernal</u> ( <i>Instituto de Ciencia de Materiales de Sevilla (CSIC-Universidad de Sevilla) C/Americo Vespucio 49, E-41092 Seville, Spain</i> ), Fernando Nuñez-Galvez, Javier Castillo-Seoane, Karen Valadez-Villalobos, Francisco J. Aparicui, Juan A. Anta, Ana Borrás, Juan R. Sanchez-Valencia, Angel Barranco<br>Organic plasma polymer for improving the stability of perovskite solar cells                                        |
| 16:45 - 17:00<br>Modelling-O6                                      | Simon Zeder, <u>Antonio Cabas Vidani</u> ( <i>Fluxim AG, 8400 Winterthur, Switzerland</i> ), Beat Ruhstaller, Urs Aeberhard<br>Assessment Of Photon Recycling In Perovskite Solar Cells By Fully Coupled Optoelectronic Simulation                                                                                                                                                                                                                                               |
| 17:00 - 17:15<br>Modelling-O7                                      | <u>Jose Carlos Pérez-Martínez</u> ( <i>Universidad Rey Juan Carlos</i> ), Diego Martin-Martin, Gonzalo del Pozo, Belén Arredondo, Beatriz Romero<br>Validation of Mazhari's Equivalent Circuit for Perovskites Solar Cells with a kink in the I-V characteristic                                                                                                                                                                                                                 |
| <b>Session D3 - OPV/DSC Manufacturing</b><br>Chair: Marina Freitag |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 15:00 - 15:30<br>Manufacturing-IS1                                 | <u>María Quintana</u> ( <i>Center for the Development of Advanced Materials and Nanotechnology, Universidad Nacional de Ingeniería</i> ), Anthony Huaman, Karim Salazar<br>Molecular interaction of natural dye based on Zea mays and Bixa orellana with nanocrystalline TiO <sub>2</sub> in dye sensitized solar cells                                                                                                                                                          |
| 15:30 - 15:45<br>Manufacturing-O1                                  | <u>Gethin Thomas</u> ( <i>SPECIFIC - Swansea University Bay Campus, Fabian Way, Crymlyn Burrows, SA1 8EN Swansea</i> ), Dr Matt Carnie<br>Waving at Solar Cells: Hand Gesture Recognition for IoT Objects Based on Patterned Monolithic Dye-Sensitized Solar Cells                                                                                                                                                                                                               |
| 15:45 - 16:00<br>Manufacturing-O2                                  | <u>Fionnuala Grifoni</u> ( <i>Laboratoire de Réactivité et Chimie des Solides (LRCS) UMR CNRS 7314 - Institut de Chimie de Picardie FR 3085 Université de Picardie Jules Verne 33 rue Saint Leu, FR-80039 Amiens Cedex, France</i> ), Waad Naim, Thomas Alnasser, Nadia Barbero, Claudia Barolo, Frédéric Sauvage<br>Insights on component optimization to reach color neutral and highly transparent near-infrared dye sensitized solar cells                                   |
| 16:00 - 16:15<br>Manufacturing-O3                                  | Benjamin Luginbuhl, Parth Raval, Tomasz Pawlak, Zhifang Du, Tonghui Wang, Grit Kuppang, Nora Schopp, Sangmin Chae, Veaceslav Coropceanu, Jean-Luc Brédas, Thuc-Quyen Nguyen, <u>G. N. Manjunatha Reddy</u> ( <i>University of Lille, CNRS, Centrale Lille Institut, Univ. Artois, UMR 8181, Unité de Catalyse et Chimie du Solide, Lille, France</i> )<br>Resolving atomic-scale interactions in non-fullerene acceptor organic solar cells by high-field NMR crystallography    |
| 16:15 - 16:30<br>Manufacturing-O4                                  | <u>Ngoc-Le Maria Lena Nguyen</u> ( <i>ARMOR Solar Power Films SAS</i> )<br>Performance and long-term stability of industrially manufactured non-fullerene based organic photovoltaics (OPV)                                                                                                                                                                                                                                                                                      |
| 16:30 - 16:45<br>Manufacturing-O5                                  | <u>Anil Kumar Bharwal</u> ( <i>Aix-Marseille Univ., Univ. Toulon, UMR CNRS 7334, Institut Matériaux Microélectronique Nanoscience de Provence (IM2NP), Marseille, France</i> ), Yatzil Avalos, Carmen Ruiz-herrero, Olivier Margeat, Christine Videtot-Ackermann, Jorg Ackermann, Ludovic Escoubas, David Duché, Jean-Jacques J.J. Simon<br>Determination of complex optical constants of PBDB-T-2F/ITIC-4F organic solar cells                                                  |
| 16:45 - 17:00<br>Manufacturing-O6                                  | <u>Philip Bellchambers</u> ( <i>Department of Chemistry, University of Warwick, CV4 7AL, Coventry, United Kingdom</i> ), Charlie Henderson, Keun-Woo Park, Jin-Kyun Lee, Ross Hatton<br>High Performance Transparent Embedded-Silver Grid Electrodes for Organic Photovoltaics Fabricated by Selective Metal Condensation                                                                                                                                                        |
| 17:00 - 17:15<br>Manufacturing-O7                                  | <u>Matías Jesús Alonso-Navarro</u> ( <i>Department of Organic Chemistry, Faculty of Chemistry, Complutense University of Madrid (UCM).</i> ), M. Mar Ramos, José L. Segura<br>Precise design of organic semiconductors based on 1,2-diketone rylenimide assemblies for (opto)electronic devices.                                                                                                                                                                                 |
| <b>Session E3 - Structure II</b><br>Chair: Lioz Etgar              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 15:00 - 15:30<br>II-IS1                                            | Rafael Abargues, <u>Pablo P. Boix</u> ( <i>Institut de Ciència dels Materials (ICMUV), Universitat de València, c Catedratic Beltran 2, 46980 Paterna, Valencia, Spain</i> )<br>Multiscale Perovskite Structures for Device-Oriented Applications                                                                                                                                                                                                                                |
| 15:30 - 15:45<br>II-O1                                             | <u>Abraham Campos-Contreras</u> ( <i>Laboratoire de Physique des Solides, CNRS, Univ. Paris-Sud, Université Paris-Saclay, 91405 Orsay Cedex, France.</i> ), Min-I Lee, Lipin Chen, Amelie Jarnac, Claire Lauhé, Gaëlle Trippé-Allard, Emmanuelle Deleporte, Olivier Plantevin, David Le Bolloc'h, Vincent Jacques, Antonio Tejeda<br>Dynamics of the Structural Modification of CH <sub>3</sub> NH <sub>3</sub> PbI <sub>3</sub> Hybrid Perovskite upon Visible-Light Excitation |
| 15:45 - 16:00<br>II-O2                                             | <u>Feng Wang</u> ( <i>Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden</i> ), Fuxiang Ji, Feng Gao<br>Structure Engineering of Halide Double Perovskites                                                                                                                                                                                                                                                                              |

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| 16:00 - 16:15<br>II-03 | <u>Sofia Masi</u> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12006 Castelló, Spain</i> ), K. M. Muhammed Salim<br>Formamidinium Perovskite Solar Cells Fabricated Under Air Conditions: Additives and Pb-O bonds promote High Efficiency and Long-Term Stability                                                                  |
| 16:15 - 16:30<br>II-04 | <u>Carlo Andrea Riccardo Perini</u> ( <i>School of Materials Science and Engineering, Georgia Institute of Technology</i> ), Andres Felipe Castro Mendez, Jacob Vagott, Magdalena Ravello, Juan-Pablo Correa-Baena<br>Understanding the formation and transformation of low dimensional capping layers in lead halide perovskites by thermal evaporation |
| 16:30 - 16:45<br>II-05 | Bruno Borges, Soheila Holakoei, Matheus Neves, Luana Wouk, Aldo Zarbin, Lucimara Roman, <u>Maria Luíza Rocco</u> ( <i>Instituto de Química da UFRJ</i> )<br>Morphology and Charge Transfer Dynamics of Water Based, Solution-Processable, Transparent and Flexible Graphene Oxide/PEDOT:PSS Nanocomposite as Electrodes for Photovoltaic Applications    |
| 16:45 - 17:00<br>II-06 | <u>Jie Xu</u> ( <i>CHOSE - Centre for Hybrid and Organic Solar Energy, University of Rome "Tor Vergata"</i> ), Suresh Kumar Podapangi, Sathy Harshavardhan Reddy, Aldo Di Carlo, Thomas Brown<br>Bandgap and morphology engineering of triple cation perovskite solar cells under indoor and sun illumination                                            |
| 17:00 - 17:15<br>II-07 | <u>Andres Felipe Castro Mendez</u> ( <i>School of Materials Science and Engineering, Georgia Institute of Technology</i> ), Juan-Pablo Correa-Baena, Carlo Andrea Perini, Junita Hidalgo, Jacob Vagott<br>Formation of a secondary phase in thermally evaporated MAPbI <sub>3</sub> and its effects on solar cell performance                            |
| 17:15 - 17:30          | <b>Closing</b>                                                                                                                                                                                                                                                                                                                                           |

## Poster Contribution

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| 011 | <b>Albert Harillo-Baños</b> ( <i>Nanoparticles and Nanocomposites G, Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)</i> ), Xabier Rodríguez-Martínez, Mariano Campoy-Quiles<br>Efficient Exploration of the Composition Space in Ternary Organic Solar Cells by Combining High-Throughput Material Libraries and Hyperspectral Imaging                                                                                       |
| 085 | <b>Samrat Das Adhikari</b> ( <i>Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló de la Plana, Castelló 12006, Spain</i> ), Carlos Echeverría-Arrondo, Rafael S. Sánchez, Vladimir S. Chirvony, Juan P. Martínez-Pastor, Saïd Agouram, Vicente Muñoz-Sanjose, Iván Mora-Seró<br>White light emission from lead-free mixed-cation doped Cs <sub>2</sub> SnCl <sub>6</sub> nanocrystals                                |
| 113 | <b>Teresa S. Ripolles</b> ( <i>Instituto de Ciencia de los Materiales de la Universidad de Valencia (ICMUV), 46980, Paterna, Valencia, Spain</i> ), Patricio Serafini, Carlos Redondo-Obispo, Esteban Climent-Pascual, Sofia Masi, Iván Mora-Seró, Carmen Coya<br>Interface Engineering by Organic Halide Salt in Perovskite Solar Cells                                                                                                 |
| 132 | <b>Fernando Núñez</b> ( <i>Instituto de Ciencia de Materiales de Sevilla (CSIC-Universidad de Sevilla) C/Americo Vespucio 49, E-41092 Seville, Spain</i> ), Alejandro Descalzo, Xabier García, Jose Manuel Obrero, Juan Ramón Sánchez, Carmen López<br>Perovskite Solar Cells Coated by Hydrophobic Fluorinated (CF <sub>x</sub> ) Layer Produced by Plasma Assisted Deposition as Protection from Environmental Degradation             |
| 153 | <b>Weiwei Zuo</b> ( <i>Institut für Photovoltaik (ipv), Universität Stuttgart, Pfaffenwaldring 47, D-70569 Stuttgart, Deutschland</i> ), Michael Saliba<br>In-situ methylammonium chloride assisted perovskite crystallization strategy for high-performance solar cells                                                                                                                                                                 |
| 157 | <b>Salma Zouhair</b> ( <i>Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstrasse 2, 79110 Freiburg, Germany</i> ), Dmitry Bogachuk, Lukas Wagner, Adil Chahboun, Andreas Hinsch, So-Min Yoo, Kim Hobeom<br>Overcoming Recombination Losses In Hole Selective Layer Free Carbon Electrode Based Perovskite Solar Cells                                                                                                       |
| 161 | <b>Gustavo de Miquel</b> ( <i>Departamento de Química Física y Termodinámica Aplicada, Instituto Universitario de Investigación en Química Fina y Nanoquímica, IUNAN Universidad de Córdoba Campus de Rabanales, Edificio Marie Curie, E-14071 Córdoba, Spain</i> )<br>Cellulose-assisted formation of 2D hybrid perovskite nanostructures for light emitting devices with enhanced stability                                            |
| 163 | <b>Lucía Martínez Goyeneche</b> ( <i>Universidad de Valencia - ICMol (Institute of Molecular Science)</i> ), Lidón Gil Escrig, Isidora Susic, Daniel Tordera, Michele Sessolo, Henk Bolink<br>Narrowband monolithic perovskite-perovskite tandem PDs                                                                                                                                                                                     |
| 166 | <b>Ismael Fernandez-Guillen</b> ( <i>Instituto Ciencia de los Materiales (ICMUV)</i> ), Pablo P. Boix, Jaume Noguera-Gomez, Pablo F. Betancour, Rafa Abargues, Uladimir Chyrvony<br>Contactless passivation in MAPbBr <sub>3</sub> single crystals                                                                                                                                                                                       |
| 194 | <b>Christopher Kershaw</b> ( <i>Faculty of Science and Engineering, Swansea University, GB</i> ), Peter Holliman, Eurig Jones, Diana Meza-Rojas, Anthony Lewis, James McGettrick, Dawn Geatches, Kakali Sen, Ya-Wen Hsiao, Sebastian Metz, Graham Tizzard, Simon Coles<br>New sulphur containing dyes to study dye-TiO <sub>2</sub> interactions in dye-sensitized solar cells                                                           |
| 199 | <b>Cristina Momblona</b> ( <i>Instituto de Ciencia de los Materiales de la Universidad de Valencia (ICMUV), 46980, Paterna, Valencia, Spain</i> ), Nadja Klipfel, Albertus Adrian Sutanto, Mounir Mensi, Cansu Igci, Klaus Leifer, Keith Brooks, Sachin Kinge, Cristina Roldán-Carmona, Paul J. Dyson, Mohammad Khaja Nazeeruddin<br>TFSI ion migration in perovskite solar cells: beneficial or detrimental?                            |
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| 201 | <b>Danbi Kim</b> ( <i>Department of Physics, Pukyong National University, Busan 48513, Republic of Korea</i> ), Eunhye Yang, Yoomi Ahn, Anqi Zhang, Sung Heum Park<br>Grain Boundary Passivation by using Polymer-Permeating Method for Highly Efficient and Stable Perovskite Solar Cell                                                                                                                                                |
| 204 | <b>Ganghong Min</b> ( <i>Department of Chemistry and Centre for Processable Electronics, Molecular Sciences Research Hub, Imperial College London, London W12 0BZ, UK</i> ), Meihuizi Jiang, Robert Westbrook, Ang Li, Thomas Webb, Thomas Macdonald, Saif Haque<br>The Effects of Antisolvents for the Growth of 2D/3D Sn Perovskite Solar Cell                                                                                         |
| 205 | <b>Mari Carmen López González</b> ( <i>Universidad Rey Juan Carlos</i> ), Gonzalo del Pozo Melero, Diego Martín Martín, Laura Muñoz Díaz, José Carlos Pérez Martínez, Enrique Hernández Balaguera, Belén Arredondo Conchillo, Yulia Galagan, Mehrdad Najafi, Beatriz Romero Herrero<br>Evaluation of active layer thickness influence in long-term stability and degradation mechanisms in CsFAPbI <sub>3</sub> perovskite solar cells   |
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| 208 | <b>Mary E. O'Kane</b> ( <i>Department of Physics and Astronomy, University of Sheffield, UK</i> ), Joel A. Smith, Tarek I. Alanazi, Elena J. Cassella, Onkar Game, David G. Lidzey<br>Further Understanding the Solution Chemistry of Perovskite Precursor Solutions                                                                                                                                                                     |
| 209 | <b>Elena Cassella</b> ( <i>Department of Physics and Astronomy, University of Sheffield, UK</i> ), Emma Spooner, Timothy Thornber, Mary O'Kane, James Bishop, Joel Smith, Onkar Game, David Lidzey<br>Spray Coating of Perovskite Solar Cells Incorporating Sprayed Self-Assembled Monolayers                                                                                                                                            |
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| 232 | <u>Raúl Ivan Sánchez-Alarcón</u> ( <i>Institut de Ciència dels Materials (ICMUV), Universitat de València, c Catedratic Beltran 2, 46980 Paterna, Valencia, Spain</i> ), Omar Eduardo Solís- Luna, María Cristina Momblona, Teresa Sanchis- Ripolles, Rafael Abargues, Pablo Perez- Boix, Vladimir Chirvony, Juan Martínez- Pastor<br>Hot injection approach for lead free tin halide-based perovskite materials synthesis for photovoltaic and optoelectronic applications                  |
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