



International Conference on Perovskite Thin Film Photovoltaics and Perovskite Photonics and Optoelectronics (NIPHO20)

Sevilla, Spain, 2020 February 23rd - 25th

Conference Chairs: Hernán Míguez, Maria Antonietta Loi and Anders Hagfeldt

Conference Program

February 23rd - Day 1 (Sunday) 1	
16:30 - 18:30	Registration
17:00 - 18:00	Workshop Editors
17:45 - 18:15	Welcome Drink
February 24th - Day 2 (Monday) 2	
08:00 - 08:45	Registration
08:45 - 09:00	Announcement of the day
	Session 1 IS Chair: Hernán Míguez
09:00 - 09:30	<u>Samuel Stranks</u> (<i>University of Cambridge - UK</i>)
IS-I1	Multi-Modal Approaches to Understand the Nature of Halide Perovskite Defects
09:30 - 10:00	<u>Laura Herz</u> (<i>University of Oxford, Department of Physics, Clarendon Laboratory, Parks Road, Oxford, OX13PU, UK</i>)
IS-I2	Radiative Recombination and Photon Recycling in Bulk and Quasi-2D Metal Halide Perovskites
10:00 - 10:30	<u>Giulia Grancini</u> (<i>University of Pavia, Italy</i>)
IS-I3	2D/3D Hybrid Perovskite Interfaces and Physics therein for Stable and Efficient Solar Cells
10:30 - 11:00	Coffee break
	Session 2 IS Chair: Maria Antonietta Loi
11:00 - 11:30	<u>Hugh Hillhouse</u> (<i>University of Washington, US</i>), Ryan Stoddard, Wiley Dunlap-Shohl
IS-I1	Quantitative Prediction of Perovskite Degradation over a Broad Range of Humidity, Oxygen, and Temperature Using Machine Learning and Training Data from Photoluminescence, Photoconductivity, and Optical Properties
11:30 - 12:00	<u>Omer Yaffe</u> (<i>Department of Materials and Interfaces, Weizmann Institute of Science, Rehovoth 76100, Israel.</i>)
IS-I2	Anharmonic Semiconductors - Lessons Learned from Halide Perovskites
12:00 - 12:30	<u>Biwu Ma</u> (<i>Department of Chemistry and Biochemistry, Florida State University, Tallahassee, 32306 Florida, United States</i>)
IS-I3	Low Dimensional Metal Halide Perovskites and Hybrids
	Session A Chair: Laura Herz
12:30 - 12:45	Adrián Francisco-López, Bethan Charles, Ma. Isabel Alonso, Miquel Garriga, Mariano Campoy-Quiles, Mark T. Weller, <u>Alejandro R. Goñi</u> (<i>Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, 08193 Bellaterra, Spain</i>)
A-O1	Understanding the Temperature Dependence of Hybrid Lead Halide Perovskite Band Gaps in Terms of the Effects of Thermal Expansion and Electron-Phonon Interaction
12:45 - 13:00	<u>Alex Barker</u> (<i>Istituto Italiano di Tecnologia - IIT</i>)
A-O2	Anomalously slow coherent phonon dephasing in mixed-cation halide perovskites



Session B

Chair: Michael Saliba

- 12:30 - 12:45 **B-O1** Juan P. Martínez-Pastor (*UMDO, Instituto de Ciencia de los Materiales, Universidad de Valencia*), Juan Navarro-Arenas, Isaac Suárez, Vladimir Chyrvony, Andrés F. Gualdrón-Reyes, Iván Mora Seró
Single-Exciton Amplified Spontaneous Emission in CsPbX₃ (X = Br, I) Perovskite Nanocrystals
- 12:45 - 13:00 **B-O2** Paul Bouteyre (*Laboratoire Aimé Cotton, CNRS, Univ. Paris-Sud, ENS Paris-Saclay, Université Paris-Saclay, 91405 Orsay Cedex, France*), Hai Son Nguyen, Jean-Sébastien Lauret, Gaëlle Trippé-Allard, Géraud Delport, Ferdinand Lédée, Hiba Diab, Ali Belarouci, Christian Seassal, Damien Garrot, Fabien Bretenaker, Emmanuelle Deleporte
DIRECTING RANDOM LASING EMISSION USING CAVITY EXCITON-POLARITONS

13:00 - 15:00 **Lunch time**

Session C

Chair: Laura Herz

- 15:00 - 15:15 **C-O1** Ana Flavia Nogueira (*Laboratory of Nanotechnology and Solar Energy, Institute of Chemistry, University of Campinas – UNICAMP*), Raphael F. Moral, Luiz Gustavo Bonato, José Carlos Germino, Willian Xerxes de Oliveira Coelho, §Rupini Kamat, Junwei Xu, Christopher J. Tassone, Michael F. Toney, Rupini Kamat, Samuel D. Stranks
Synthesis of Polycrystalline Ruddlesden-Popper Organic Lead Halides and Their Growth Dynamics
- 15:15 - 15:30 **C-O2** Juan F. Galisteo-López (*Instituto de Ciencia de Materiales de Sevilla (CSIC-US) , 41092, Seville, Spain*), David O. Tiede, Mauricio E. Calvo, Hernán Míguez
Local study on the role of defects in the photophysics of mixed halide perovskites
- 15:30 - 15:45 **C-O3** Karunakara Moorthy Boopathi, Beatriz Martin-Garcia, Aniruddha Ray, Liberato Manna, Ahmed Abdelhady (*Istituto Italiano di Tecnologia - IIT*)
Irreversible Lattice Compression Lights Up Perovskites
- 15:45 - 16:00 **C-O4** Mojtaba Abdi Jalebi (*Institute for Materials Discovery, University College London, Torrington Place, London WC1E 7JE, UK*)
Highly Luminescent and Stable Metal Halide Perovskite Optoelectronic Devices via Chemical Modifications and Passivation Approaches
- 16:00 - 16:15 **C-O5** Simon Kahmann (*University of Groningen - NL*), Eelco K. Tekelenburg, Herman Duim, Maria A. Loi
Self-Trapped Excitons in Low-Dimensional Perovskites - Do They Exst?
- 16:15 - 16:30 **C-O6** Stuart Macpherson (*Optoelectronics Group, Cavendish Laboratory, University of Cambridge, UK.*), Andrew Winchester, Tiarnan Doherty, Krzysztof Galkowski, Duncan Johnstone, Kyle Frohna, Miguel Anaya, Michael Man, Paul Midgely, Keshav Dani, Samuel Stranks
Control of Nanoscale Surface Defects and the Relation to Local Structural Properties in Halide Perovskite Films
- 16:30 - 16:45 **C-O7** Géraud Delport (*Optoelectronics Group, Cavendish Laboratory, University of Cambridge, UK.*), Samuel D Stranks
Probing the diffusion of excitons in 2D perovskites using optical microscopy.
- 16:45 - 17:00 **C-O8** Alicia de Andrés (*Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas*), Carlos Redondo-Obispo, Esteban Climent-Pascual, Javier Bartolomé-Vilchez, Carlos Zaldo, Carmen Coya
Light Induced Ion Migration in Bi-Doped MAPbI₃ for Enhanced Photo-Stability

Session D

Chair: Michael Saliba

- 15:00 - 15:15 **D-O1** Miguel Anaya (*Optoelectronics Group, Cavendish Laboratory, University of Cambridge, UK.*), Kyle Frohna, Linsong Cui, Javad Shamsi, Sam Stranks
Probing local photophysical properties in perovskite based light-emitting devices



15:15 - 15:30 D-02	<u>Changsoon Cho</u> (<i>Optoelectronics Group, Cavendish Laboratory, University of Cambridge, UK.</i>), Baodan Zhao, Gregory Tainter, Frederik Nehm, Karl Leo, Jung-Yong Lee, Richard Friend, Dawei Di, Felix Deschler, Neil Greenham Quantification of Photon Recycling Effect in Perovskite Light-Emitting Diodes
15:30 - 15:45 D-03	<u>Nadja Giesbrecht</u> (<i>Department Chemie, Ludwig-Maximilians-Universität München, Butenandtstr. 5 – 13, 81377 München, Germany</i>), Andreas Weis, Thomas Bein Perovskite-Inspired 2D Antimony-Based Absorber Layers for Optoelectronic Applications
15:45 - 16:00 D-04	<u>Sergey Makarov</u> (<i>ITMO University, St. Petersburg, Russia</i>) Halide perovskites based nanophotonics: from fundamentals to applications
16:00 - 16:15 D-05	<u>Mauricio Calvo</u> (<i>Instituto de Ciencia de Materiales de Sevilla, Consejo Superior de Investigaciones Científicas (CSIC), Universidad de Sevilla</i>), Laura Calì, Andrea Rubino, Hernán Míguez Porous metal oxide matrices as templating host of ABX ₃ perovskite nanocrystals
16:15 - 16:30 D-06	<u>Juan Jesús Gallardo</u> (<i>Department of Physical Chemistry. Faculty of Science. University of Cádiz. Spain.</i>), María Isabel Rodríguez, Eduardo Blanco, Javier Navas Study of the Photoluminescent Emission of Perovskites Quantum Dots with Complex Cation in A-Site.
16:30 - 16:45 D-07	<u>Sarthak Jariwala</u> (<i>University of Washington, US</i>), Hongyu Sun, Gede W.P. Adhyaksa, Andries Lof, Loreta Muscarella, Bruno Ehrler, Erik C. Garnett, David S. Ginger Local Crystal Misorientation Influences Non-radiative Recombination in Halide Perovskites
16:45 - 17:00 D-08	Andrea Rubino, <u>Gabriel Lozano</u> (<i>Instituto de Ciencia de Materiales de Sevilla (CSIC-Universidad de Sevilla), C/ Americo Vespucio 49, Seville, E-41092, Spain.</i>), Mauricio E. Calvo, Hernán Míguez Determination of the optical constants of metal-halide perovskite nanocrystals
17:00 - 19:00	Poster session
20:15 - 22:00	Social Dinner



February 25th - Day 3 (Tuesday) 3

08:45 - 09:00 **Announcement of the day**

Session 3 IS

Chair: Anders Hagfeldt

09:00 - 09:30 Michael Graetzel (*Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland*)

IS-I2 High Performance Perovskite Solar Cells Based on Amphiphilic Spacer Molecules

09:30 - 10:00 Filippo De Angelis (*University of Perugia*), Damiano Ricciarelli, Daniele Meggiolaro

IS-I1 Stabilizing Tin-Iodide Perovskites: A Desperate Case?

10:00 - 10:30 Monica Lira-Cantu (*Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona*

IS-I3 *Institute of Science and Technology (BIST), Campus UAB, Bellaterra, 08193 Barcelona, Catalonia, Spain*)

Defect passivation in halide perovskite materials for highly efficient and highly stable perovskite solar cells

10:30 - 11:00 **Coffe break**

Session 4 IS

Chair: Sam Stranks

11:00 - 11:30 Michael Saliba (*TU Darmstadt, Optoelectronics*)

IS-I1 Polyelemental, Multicomponent Perovskite Semiconductor Libraries through Combinatorial Screening

11:30 - 12:00

12:00 - 12:30 Marina Leite (*University of Maryland*)

IS-I2 Dynamics of Perovskites: from the Nano to the Macroscale

Industry

12:30 - 12:45 Asger Jensen (*NKT Photonics*)

Industry-S1 Supercontinuum lightsources in optical characterisation of perovskites

Session E

Chair: Giulia Grancini

12:45 - 13:00 Juan Bisquert (*Universitat Jaume I, Institute of Advanced Materials (INAM) - Spain*)

E-O1 Understanding the physical response of perovskite solar cells by frequency domain and time transient decay methods

13:00 - 13:15 Alessio Gagliardi (*Dept. Electrical and Computer Eng., Technische Universitaet Muenchen*), Felix Mayr

E-O2 Machine learning based screening of mixed lead-free double-perovskites

Session F

Chair: Marina Leite

12:45 - 13:00 Alexander Davis Jodlowski (*University of Pavia, Italy*), Cristina Roldán-Carmona, Giulia Grancini, Manuel Salado, Maryline Ralaifarisoa, Shahzada Ahmad, Norbert Koch, Luis Camacho, Gustavo de Miguel, Mohammad Khaja Nazeeruddin

F-O2 Large guanidinium cation mixed with methylammonium in lead iodide perovskites for 19% efficient solar cells.

13:00 - 13:15 Jia li, Wang Hao, Herilna Dewi, Nripan Mathews, Subodh Mhaisalkar, Annalisa Bruno (*Energy Research Institute @ NTU (ERI@N), Research Techno Plaza, X-Frontier Block, Level 5, 50 Nanyang Drive 637553, Singapore*)

F-O1 Large Area Perovskite Solar Cells and Mini-Modules by Thermal Co-Evaporation

13:15 - 15:00 **Lunch Time**

Session G

Chair: Giulia Grancini

15:00 - 15:15 Selina Olthof (*University of Cologne, Institute for Physical Chemistry*), Shuxia Tao, Geert Brocks

G-O1 Tuning the Electronic Structure of Perovskites via Composition - A Combined Theoretical and Experimental Approach



15:15 - 15:30 G-O2	<u>Giles Richardson</u> (<i>Department of Mathematical Sciences, University of Southampton</i>), Nicola Courtier, Laurence Bennett, Juan Anta, Antonio Exposito Using Drift-Diffusion Models as a Tool to Probe the Physics of Perovskite Solar Cells
15:30 - 15:45 G-O3	<u>Shuxia Tao</u> (<i>Center for Computational Energy Research, Applied Physics, Eindhoven University of Technology, The Netherlands</i>) The Role of Additives in Efficient and Stable Perovskite Solar Cells: Atomistic Insights from Both Experiments and DFT Simulations
15:45 - 16:00 G-O4	<u>Kimberley Savill</u> (<i>Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, United Kingdom</i>), Matthew Klug, Rebecca Milot, Henry Snaith, Laura Herz Charge-Carrier Cooling and Polarization Memory Loss in Formamidinium Tin Triiodide
16:00 - 16:15 G-O5	<u>Gustavo de Miguel</u> (<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, Córdoba, Spain</i>) Incorporation of the Guanidinium Cation into Two-dimensional Hybrid Perovskites
16:15 - 16:30 G-O6	<u>Svetlana Sirotinskaya</u> (<i>University of Duisburg-Essen, Faculty of Engineering, Institute of Technology for Nanostructures (NST), Germany</i>), Karsten Rojeck, Roland Schmechel, Niels Benson Defect State Investigations in Methylammonium Lead Iodide Using the MIS-TSC Method
16:30 - 16:45 G-O7	<u>Maryam Sajedi</u> (<i>HELMHOLTZ - ZENTRUM BERLIN FÜR MATERIALIEN UND ENERGIE GMBH</i>), Maxim Krivenkov, Dmitry Marchenko, Andrei Varykhalov, Anoop Chandran, Irene Aguilera, Jaime Sanchez-Barriga, Oliver Rader Absence of giant Rashba effect in the valence band of CsPbBr ₃
16:45 - 17:00 G-O8	<u>Iván Mora-Seró</u> (<i>Universitat Jaume I, Institute of Advanced Materials (INAM) - Spain</i>) Perovskite Crystalline Phase Stability Beyond the Goldschmidt Tolerance Factor

Session H

Chair: Marina Leite

15:00 - 15:15 H-O1	<u>Narges Yaghoobi Nia</u> (<i>1 CHOSE. (Centre for Hybrid and Organic Solar Energy), University of Rome "Tor Vergata", via del Politecnico 1, Rome 00133, Italy.</i>), Mahmoud Zendehelel, Luigi Angelo Catriotta, Zhaoxiang Zheng, Aldo Di Carlo Boosting Efficiency and Thermal stability of Large Area Perovskite Solar Modules Beyond 16.5%: The case of Polymeric and Small Molecule Hole Transport Layer
15:15 - 15:30 H-O2	S. M. H Qaid, B. A Al-Asbahi, H. M. Ghaithan, <u>A.S. Aldwayyan</u> (<i>King Saud University, Physics and Astronomy department</i>) Optical and Structural Properties of CsPbBr ₃ Perovskite Quantum Dots/PFO Polymer Composite Thin Films
15:30 - 15:45 H-O3	<u>Rafael Abarques</u> (<i>UMDO, Instituto de Ciencia de los Materiales, Universidad de Valencia</i>), Iván Sánchez-Alarcón, Jaume Noguera, Vladimir Chirvony, Juan F. Sánchez- Royo, Pedro J. Rodríguez-Canto, M. Aguilar-Frutis, G. Alarcón-Flores, Juan P. Martínez- Pastor Spray-driven Solid-State Halide Exchange in CsPbX ₃ Nanocrystal Films
15:45 - 16:00 H-O4	Jesus Idigoras, Francisco J. Aparicio, Lidia Contreras-Bernal, Susana Ramos-Terron, Maria Alcaire, Juan R. Sanchez-Valencia, Ana Borrás, Juan A. Anta, <u>Angel Barranco</u> (<i>Instituto de Ciencia de Materiales de Sevilla (CSIC-Universidad de Sevilla), Spain.</i>) Ultrathin Plasma Polymers: a new family of encapsulants to achieve waterproof perovskite solar cells.
16:00 - 16:15 H-O5	<u>Konrad Domanski</u> (<i>Fluxim AG, Winterthur, Switzerland</i>), Brian Carlsen, Essa Alharbi, Michael Gratzel, Anders Hagfeldt, Wolfgang Tress Performance of Perovskite Solar Cells under Real-World Temperature-Illumination Variations in the Lab
16:15 - 16:30 H-O6	Angel Barranco, Carmen Lopez-Santos, Jesus Idigoras, Francisco J. Aparicio, Jose Obrero, Javier Castillo-Seoane, Victor Lopez-Flores, Lidia Contreras-Bernal, Victor Rico, Javier Ferrer, Juan P. Espinos, Ana Borrás, Juan A. Anta, <u>Juan R. Sanchez-Valencia</u> (<i>Instituto de Ciencia de Materiales de Sevilla (CSIC-Universidad de Sevilla), C/ Americo Vespucio 49, Seville, E-41092, Spain.</i>) Vacuum sublimation of Dopant-Free Crystalline Spiro-OMeTAD films to enhance the Stability of Perovskite Solar Cells

NIPHO

Perovskite Solar Cells,
Photonics and Optoelectronics

SEVILLE
SPAIN
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16:30 - 16:45 H-07	<u>Lidia Contreras-Bernal</u> (<i>Pablo de Olavide University, Sevilla, Spain</i>), Antonio Riquelme, Juan Jesús Gallardo, Javier Navas, Jesús Idígoras, Juan Antonio Anta Water Vapour Pressure as Main Lab Parameter to Fabricate High Efficiency Perovskite Solar Cells at Ambient Conditions
16:45 - 17:00 H-08	<u>Sandy Sanchez</u> (<i>Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland</i>), Anders Hagfeldt Rapid Processing for Perovskite Solar Cells: Control of the Perovskite Intermediate Phases from Solution to Crystal Growth



Poster Contribution

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| 010 | <u>Susana Ramos Terrón</u> (<i>Universidad de Córdoba, Instituto Universitario de Investigación en Química Fina y Nanoquímica, IUNAN, Spain</i>), Alexander Davis Jodlowski, Cristóbal Verdugo Escamilla, Luis Camacho, Gustavo de Miguel
Relaxing the Goldschmidt Tolerance Factor: Sizable Incorporation of the Guanidinium Cation into a Two-dimensional Ruddlesden-Popper Perovskite |
| 011 | <u>Tiarnan Doherty</u> (<i>Optoelectronics Group, Cavendish Laboratory, University of Cambridge, UK.</i>), Andrew Winchester, Stuart Macpherson, Duncan Johnstone, Vivek Pareek, Elizabeth Tennyson, Sofia Kosar, Felix Kosasih, Miguel Anaya, Mojtaba Abdi-Jalebi, Zahra Andaji-Garmaroudi, E Laine Wong, Julien Madeo, Yu-Hsien Chiang, Ji-Sang Park, Young-Kwang Jung, Christopher Petoukhoff, Giorgio Divitini, Michael Man, Caterina Ducati, Aron Walsh, Paul Midgley, Keshav Dani, Samuel Stranks
Nanoscale Heterogeneities Limit Optoelectronic Performance in Halide Perovskites |
| 014 | <u>Andrea Rubino</u> (<i>Instituto de Ciencia de Materiales de Sevilla (ICMS-CSIC)</i>), Mauricio Calvo, Hernan Miguez, Alejandro Goñi
Lattice Dynamics of MAPbI ₃ Nanocrystals |
| 015 | <u>Changsoon Cho</u> (<i>IAPP (Institut fuer Angewandte Photophysik)</i>), Alexander Palatnik, Markas Sudzius, Frederik Nehm, Karl Leo
Study of Amplified Spontaneous Emission in CsPbBr ₃ perovskite |
| 018 | <u>Zongbao Zhang</u> (<i>Institut für Angewandte Photophysik, TU Dresden</i>), Ran Ji, Martin Kroll, Changsoon Cho, Tim Schramm, Lukasz Baisinger, Frederik Nehm, Karl Leo
Two dimensional evaporated perovskite for photovoltaic applications |
| 019 | <u>Ran Ji</u> (<i>Institut für Angewandte Photophysik (IAPP)</i>), Zongbao Zhang, Martin Kroll, Frederik Nehm, Karl Leo
Vacuum evaporated MA-free perovskites and post-annealing influences |
| 023 | <u>Andrés Fabián Gualdrón-Reyes</u> (<i>Universitat Jaume I, Institute of Advanced Materials (INAM) - Spain</i>), Jhonatan Rodríguez-Pereira, Eliseo Amado-González, Jorge-Enrique Rueda-P, Rogelio Ospina, Sofia Masi, Seog Joon Yoon, Juan Tirado, Franklin Jaramillo, Said Agouram, Vicente Muñoz-Sanjosé, Sixto Giménez, Iván Mora-Seró
The role of surface chemical states on the photocatalytic behavior of all-inorganic mixed halide perovskite nanocrystals |
| 024 | <u>Juvet Nche Fru</u> (<i>University of Pretoria, South Africa</i>), Nolwazi Nombona, Mmantsae Diale
Synthesis and Characterization of Halide Hybrid Perovskites Thin Films by Sequential Physical Vapor Deposition |
| 025 | <u>Taimoor Ahmad</u> (<i>CHOSE - Centre for Hybrid and Organic Solar Energy, University of Rome "Tor Vergata"</i>)
Highly efficient large area flexible perovskite solar cells employing novel fullerene derivative as an electron transport layer |
| 028 | <u>Maximilian Sirtl</u> (<i>Department of Chemistry and Center for NanoScience (CeNS), University of Munich (LMU) Butenandtstr. 11, 81377 Munich, Germany</i>), Melina Armer, Lennart Reb, Rik Hooijer, Patrick Dörfinger, Manuel Scheel, Pandit Pallavi, Roth Stefan, Peter Müller-Buschbaum, Vladimir Dyakonov, Thomas Bein
Optoelectronic Properties of Cs ₂ AgBiBr ₆ Thin Films: The Influence of the Precursor Stoichiometry |
| 030 | <u>Daniel Saponi</u> (<i>Univ. Grenoble Alpes, CEA, LITEN, INES, F-73375 Le Bourget-du-lac, France</i>), Olivier Dupré, Julien Diaz, Apolline Puaud, Solenn Berson, Delfina Munoz
Toward Industrialization of Monolithic Perovskite/Silicon-Heterojunction Tandem Solar Cells: Screen-Printing Metallization Development |
| 033 | <u>David O. Tiede</u> (<i>University of Münster, Institute of Physics, Münster, 48149, Germany</i>), Andrea Rubino, Mauricio E. Calvo, Juan F. Galisteo-López, Hernán Miguez
Lead halide perovskite nano crystal growth within porous matrices |
| 036 | <u>José Manuel Vicent-Luna</u> (<i>Eindhoven University of Technology, Center for Computational Energy Research</i>), Sofia Aperi, Salvador R. G. Balestra, Sofia Calero, Juan A. Anta, Shuxia Tao
DFTB and Classical Molecular Dynamics Simulations of Mixed Halide Perovskite Solar Cells |
| 040 | <u>Martin Kroll</u> (<i>Institute of Applied Physics, TU Dresden</i>), Tim Schramm, Ran Ji, Zongbao Zhang, Changsoon Cho, Frederik Nehm, Karl Leo
Lead-free co-evaporated perovskites for solar cell application |



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| 041 | <u>Anjana Wijesekara</u> (<i>Department of Chemistry, University of Warwick</i>), Ross Hatton
Transparent copper grid electrodes for perovskite photovoltaics |
| 052 | <u>Laura Calì</u> (<i>Multifunctional Optical Materials group, Institute of Materials Science of Seville, Consejo Superior de Investigaciones Científicas (CSIC)- Universidad de Sevilla (US). Américo Vespucio 49, 41092, Seville, Spain</i>), Aaron Bayles, Sol Carretero-Palacios, Gabriel Lozano, Mauricio E. Calvo, Hernán Míguez
Experimental evidence of plasmonic-enhanced absorption and emission of perovskite thin film embedding silver nanocubes |
| 053 | Juan Pablo Guerrero, Victor Romero, Diego Esparza, Isaac Zarazua, Haggeo Desirena, Alejandro Torres-Castro, Jin Z. Zhang, <u>Tzarara López-Luke</u> (<i>Instituto de Investigación en Metalurgia y Materiales, Universidad Michoacana de San Nicolás de Hidalgo. Edificio U, Ciudad Universitaria. 58030 Morelia Mich. México.</i>)
Study the effect of bismuth on the structural and optical properties of the CsPb1-xBixBr3 perovskite QDs |
| 055 | <u>Namrata Pant</u> (<i>Interdisciplinary Graduate School of Medicine and Engineering, University of Yamanashi</i>), Masatoshi Yanagida, Yasuhiro Shirai, Kenjiro Miyano
Influence of Nickel oxide underlayer on the crystallisation, optoelectronic properties and performance of perovskite solar cells |
| 058 | <u>Hamid Pashaei Adl</u> (<i>Instituto de Ciencia de Materiales (ICMUV), Universidad de Valencia, C/ Catedrático José Beltrán, 2, E-46980 Paterna, Spain.</i>), Setatira Gorji, Isaac Suarez, Vladimir Chirvony, Andrés F. Gualdrón-Reyes, Ivan Mora-Seró, Luisa M. Valencia Liñan, Maria de la Mata Fernandez, Miriam Herrera Collado, Sergio I. Molina Rubio, Carlos J. Zapata-Rodríguez, Juan P. Martínez Pastor
Purcell Enhancement of the Spontaneous Emission of CsPbI3 Perovskite Nano-Crystals by using Hyperbolic Metamaterials |
| 060 | <u>Juan Navarro Arenas</u> (<i>Instituto de Ciencia de Materiales (ICMUV), Universidad de Valencia, C/ Catedrático José Beltrán, 2, E-46980 Paterna, Spain.</i>), Isaac Suárez, Vladimir Chirvony, Andrés F. Gualdrón Reyes, Iván Mora Seró, Juan P. Martínez Pastor
Photon Recycling in CsPbBr3 Perovskite Nanocrystal Integrated in Polymer Waveguides |
| 076 | <u>Aleksandra Furasova</u> (<i>ITMO University, St. Petersburg, Russia</i>), Sergey Makarov, Pavel Voroshilov, Aldo Di Carlo
Influence of resonant silicon nanoparticles on light and carrier management of perovskite solar cells |
| 079 | <u>Loreta Muscarella</u> (<i>Center for Nanophotonics, AMOLF, Science Park 104, The Netherlands</i>), Eline Hutter, Sandy Sanchez, Christian Dieleman, Tom Savenije, Anders Hagfeldt, Michael Saliba, Bruno Ehrler
Crystal Orientation and Grain Size: Do They Determine Optoelectronic Properties of MAPbI3 Perovskite? |
| 080 | <u>Zehua Chen</u> (<i>Center for Computational Energy Research, Department of Applied Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands</i>), Geert Brocks, Peter Bobbert, Shuxia Tao
Thermodynamics and kinetics of light-induced phase segregation in mixed halide hybrid perovskites |
| 081 | <u>Laurence LUTSEN</u> (<i>IMEC, Imomec, Diepenbeek (Belgium)</i>), Wouter Van Gompel, Roald HERCKENS, Paul-Henry DENIS, Martijn MERTENS, Kristof VAN HECKE, Dirk VANDERZANDE
Towards 2D Layered Hybrid Perovskites With Enhanced Functionality. |