

nanoGe Fall Meeting 2018 (FallMeeting18)

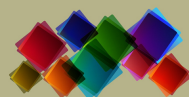
S7 Fundamental Aspects of Perovskite Solar Cells and Optoelectronics

Torremolinos, Spain, 2018 October 22nd - 24th

Conference Chairs: Laura Herz and Tze-Chien Sum

Conference Program

October 22nd - Day 1 (Monday)	
Plenary session 1 Chair: Mischa Bonn	
09:00 - 09:30 1-K1	<u>Victor Klimov</u> (<i>Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA</i>) Colloidal Quantum Dot Lasing: Historical Perspective and Recent Progress
Plenary Session 2 Chair: Kevin Sivula	
09:00 - 09:30 2-K1	<u>Yun Jeong Hwang</u> (<i>Korea Institute of Science and Technology (KIST)</i>), Byoun Koun Min, Hyeong-Suk Oh Electrochemical Conversion of CO ₂ toward Valuable Chemicals for Solar-to-Chemical Conversion Application
PerFun S7.1 Chair: Matthew C. Beard	
09:30 - 10:00 S7.1-11	<u>David Cahen</u> (<i>Weizmann Institute of Science & Bar Ilan University</i>) What Remains Special about Halide Perovskites?
10:00 - 10:30 S7.1-12	<u>Robert Lovrincic</u> (<i>Institute for High Frequency Technology, TU Braunschweig</i>) Compositional Doping of Lead Halide Perovskites
10:30 - 11:00	Coffee Break
PerFun S7.2 Chair: Xing Guichuan	
11:00 - 11:15 S7.2-O1	<u>Timothy Crothers</u> (<i>Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, United Kingdom</i>), Rebecca Milot, Jay Patel, Elizabeth Parrott, Johannes Schlipf, Peter Müller-Buschbaum, Michael Johnston, Laura Herz The Role of Photon Reabsorption in Masking Intrinsic Bimolecular Charge-Carrier Recombination in CH ₃ NH ₃ PbI ₃ Perovskite.
11:15 - 11:30 S7.2-O2	<u>Young-Kwang Jung</u> (<i>Yonsei University</i>), Keith T. Butler, Aron Walsh Bond Formation and Carrier Confinement at Epitaxial Interface between PbS and CsPbBr ₃
11:30 - 11:45 S7.2-O3	Adrián Francisco-López, Bethan Charles, Oliver J. Weber, María 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>) Pressure-Induced Locking of Methylammonium Cations Versus Amorphization in Hybrid Lead Iodide Perovskites
11:45 - 12:00 S7.2-O4	<u>Katarzyna Pydzinska</u> (<i>Faculty of Physics, Adam Mickiewicz University in Poznań, Umultowska 85, 61-614 Poznań, Poland</i>), Jerzy Karolczak, Janusz Szeremeta, Konrad Wojciechowski, Marcin Ziolk Transient Absorption of Perovskite Solar Cells. Differences in the Transient Features due to Synthesis Methods and Proper Determination of the Second Order Recombination Rate Constant
12:00 - 12:15 S7.2-O5	<u>Mingjie Li</u> (<i>School of Physical and Mathematical Sciences, Nanyang Technological University, 21 Nanyang Link, Singapore 637371</i>), Tze Chien Sum Slow Cooling and Highly Efficient Extraction of Hot-Carriers in Perovskite Nanocrystals: Towards Hot-Carrier Perovskite Solar Cell
12:15 - 12:30	
12:30 - 14:30	Lunch



PerFun S7.3

Chair: David Cahen

- 14:30 - 15:00 **Matthew Beard** (*National Renewable Energy Laboratory, Golden, Colorado, USA*)
S7.3-I1 Time-Resolved Optical Studies of Perovskite Polycrystalline Films, Single Crystals and their Surfaces
- 15:00 - 15:30 **Guichuan Xing** (*Institute of Applied Physics and Materials Engineering, University of Macau, Macau SAR, China 999078*)
S7.3-I2 Light Emission from Metal-Halide Perovskites
- 15:30 - 16:00 **Laurent Pedesseau** (*Fonctions Optiques pour les Technologies de l'Information (FOTON), Institut National des Sciences Appliquées (INSA) de Rennes, CNRS, UMR 6082, 35708 Rennes, France*), Arthur Marronnier, Guido Roma, Soline Boyer-Richard, Jean-Marc Jancu, Yvan Bonnassieux, Claudine Katan, Constantinos Stoumpos, Mercuri Kanatzidis, Jacky Even
S7.3-O1 Black Phases of CsPbI₃: Structural and Theoretical Studies
- 16:00 - 16:30 Tufan Ghosh, Sigalit Aharon, Lioz Etgar, **Sanford Ruhman** (*Institute of Chemistry, The Hebrew University, Jerusalem 91904, Israel*)
S7.3-I3 Gauging Photorefractive Effects on Transient Absorption in Lead Iodide Perovskite Thin Films by Comparison to Nanocrystals.
- 16:30 - 17:00 **Mikael Kepenekian** (*Univ Rennes, ENSCR, INSA Rennes, CNRS, ISCR (Institut des Sciences Chimiques de Rennes) - UMR6226, F-35000 RENNES*), Boubacar Traore, Jean-Christophe Blancon, Hsinhan Tsai, Wanyi Nie, Konstantinos Stoumpos, Laurent Pedesseau, Claudine Katan, Sergei Tretiak, Mercuri Kanatzidis, Jacky Even, Aditya Mohite
S7.3-O2 Making and breaking the exciton in layered halide hybrid perovskites

October 23rd - Day 2 (Tuesday)

PerFun S7.4

Chair: Robert Lovrincic

- 09:00 - 09:30
- 09:30 - 10:00 **Selina Olthof** (*University of Cologne, Institute for Physical Chemistry*)
S7.4-I1 Unravelling the Electronic Structure of Hybrid Perovskites and their Interfaces
- 10:00 - 10:30 **Luis Pazos-Outon** (*Electrical Engineering and Computer Sciences, University of California, Berkeley*), T. Patrick Xiao, Eli Yablonovitch
S7.4-O1 Fundamental Efficiency Limit of Lead Iodide Perovskite Solar Cells

10:30 - 11:00 **Coffee Break**

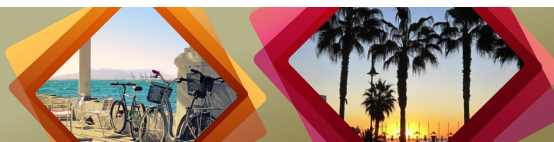
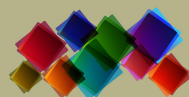
PerFun S7.5

- 11:00 - 11:30 **Juan Bisquert** (*Institute of Advanced Materials (INAM), Universitat Jaume I*)
S7.5-O1 Ionic Transport, Defects and Electrooptical Response of Perovskite Solar Cells
- 11:30 - 12:00 **Adam Pockett** (*SPECIFIC, Swansea University*), Jenny Baker, Trystan Watson, Matt Carnie
S7.5-O2 Ion Migration in Triple Mesoporous 2D/3D Perovskite Solar Cells
- 12:00 - 12:30 **Antonio Guerrero** (*Institute of Advanced Materials (INAM), Universitat Jaume I*)
S7.5-O3 Ionic Diffusion Quantification in Lead Halide Perovskites

12:30 - 14:30 **Lunch**

joint session S7/S8

- 14:30 - 15:00 **Filippo De Angelis** (*Computational Laboratory for Hybrid/Organic Photovoltaics (CLHYO), CNR-ISTM, Perugia, Italy*)
S7/S8-I1 Defect photophysics of metal-halide perovskites
- 15:00 - 15:30 **Koichi Yamashita** (*Department of Chemical System Engineering, Graduate School of Engineering, The University of Tokyo*)
S7/S8-I2 Charge Separation and Charge Carrier Trapping of Lead Iodide Perovskites



- 15:30 - 16:00 **Edoardo Mosconi** (*Computational Laboratory for Hybrid/Organic Photovoltaics (CLHYO), Istituto CNR di Scienze e Tecnologie Molecolari (ISTM-CNR), Via Elce di Sotto 8, 06123, Perugia, Italy.*)
S7/S8-I3 Mobile Ions in Organohalide Perovskites: Interplay of Electronic Structure and Dynamics
- 16:00 - 16:30 **Claudine Katan** (*Univ Rennes, ENSCR, INSA Rennes, CNRS, ISCR (Institut des Sciences Chimiques de Rennes) - UMR6226, F-35000 RENNES*), Boubacar Traore, Mikael Képénékian, Laurent Pedesseau, Jean-Christophe Blancon, Wanyi Nie, Hsinhan Tsai, Sergei Tretiak, Constantinos Stoumpos, Mercuri Kanatzidis, Aditya Mohite, Jacky Even
S7/S8-I4 Halide Perovskites: Recent Advances in Optoelectronic Properties from Atomic Scale Modelling

17:30 - 19:00 **Poster Session**

October 24th - Day 3 (Wednesday)

Plenary session 3

Chair: Shannon Boettcher

- 09:00 - 09:30 **Francesca Maria Toma** (*Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720, United States*)
3-K1 A New Portrait of Functional Complex Interfaces for Solar Fuel Devices

Plenary Session 4

Chair: David Egger

- 09:00 - 09:30 **Vanessa Wood** (*Laboratory for Interfacial Chemistry, ETH Zurich*)
4-K1 Charge Transport in Nanocrystal Solids

PerFun S7.7

Chair: Koichi Yamashita

- 09:30 - 10:00 **Felix Deschler** (*University of Cambridge, UK*)
S7.7-I1 Investigation of Electronic and Structural Dynamics in Metal-Halide Perovskites with Ultrafast Spectroscopy
- 10:00 - 10:30 **Artem Bakulin** (*Department of Chemistry, Imperial College London, South Kensington, London, SW7 2AZ, UK*)
S7.7-I2 Organic Cation in Hybrid Perovskite Materials and Interfaces

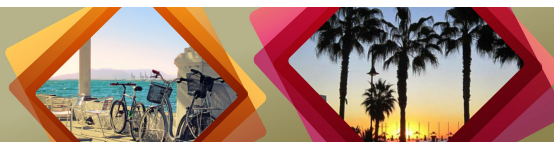
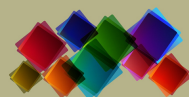
10:30 - 11:00 **Coffee Break**

PerFun S7.8

- 11:00 - 11:30 **Vladimir Chirvony** (*Instituto de Ciencia de los Materiales, Universidad de Valencia, c/Catedrático J. Beltrán, 2, Paterna 46980, Spain*), Juan Martínez-Pastor, Henk Bolink
S7.8-O1 Long-Lived Luminescence and Slow Carrier Diffusion in Metal Halide Perovskites as a result of Multiple Trapping and De-Trapping by Shallow Non-Quenching Traps
- 11:30 - 12:00 **Holger Röhm** (*Light Technology Institute, Karlsruhe Institute of Technology, Karlsruhe, 76131, Germany*), Tobias Leonhard, Michael J. Hoffmann, Alexander Colsmann
S7.8-O2 Ferroelectric domains in methylammonium lead iodide perovskite solar cells

12:00 - 12:30

12:30 - 14:30 **Lunch**



Poster Contribution

128	<u>Bora Kim</u> (<i>Department of Energy Science, Sungkyunkwan University, Suwon 16419, Republic of Korea</i>), Duc Anh Nguyen, Hyojung Kim, Dae Young Park, Jung Yup Yang, Mun Seok Jeong Inorganic 2-D Transition Metal Dichalcogenides Charge Transport Layers for Perovskite Solar Cells
130	<u>Hyojung Kim</u> (<i>Department of Energy Science, Sungkyunkwan University, Suwon, 16419, Republic of Korea</i>), Hye Ryung Byun, Mun Seok Jeong Synthesis and Characterization of Rb(MAFA) Perovskite Single Crystals
174	Boubacar Traore, <u>Laurent Pedesseau</u> (<i>Univ Rennes, INSA Rennes, CNRS, Institut FOTON - UMR6082, F-35000 RENNES</i>), Linda Assam, Xiaoyang Che, Jean-Christophe Blancon, Hsinhan Tsai, Wanyi Nie, Constantinos Stoumpos, Mercouri Kanatzidis, Sergei Tretiak, Aditya Mohite, Jacky Even, <u>Mikaël Képenékian</u> (<i>Univ Rennes, ENSCR, INSA Rennes, CNRS, ISCR (Institut des Sciences Chimiques de Rennes) - UMR6226, F-35000 RENNES</i>), <u>Claudine Katan</u> (<i>Univ Rennes, ENSCR, INSA Rennes, CNRS, ISCR (Institut des Sciences Chimiques de Rennes) - UMR6226, F-35000 RENNES</i>) Composite Approach for Layered Hybrid Perovskites: Band Alignment, Quantum and Dielectric Confinements
222	<u>Thi Tuyen Ngo</u> (<i>Institute of Advanced Materials (INAM), Universitat Jaume I, 12006 Castelló, Spain</i>), Miri Kazes, Dan Oron, Ivan Mora-Sero Perovskite Films with Embedded Quantum Dots for Photovoltaic Applications
285	<u>Franco Decker</u> (<i>Università La Sapienza</i>), Danilo Dini, Diego Di Girolamo, Fabio Matteocci, Aldo Di Carlo Perovskite Solar Cells (PSCs) with Inverted Architecture: Optimization of the Conditions of Deposition for the Improvement of Photoconversion Efficiency
289	<u>Xiaoping Chen</u> (<i>Global Research Center for Environment and Energy based on Nanomaterials Science (GREEN), National Institute for Materials Science (NIMS)</i>), Yasuhiro Shirai, Masatoshi Yanagida, Kenjiro Miyano Recombination between Free Carriers and Mobile Ions in Perovskite Solar Cells, an Impedance Study
299	<u>Eui Jin Lee</u> (<i>DGIST</i>), Dae-Hwan Kim, Dae-Kue Hwang Enhanced Performance of Inorganic Perovskite Solar Cells by Incorporating of Chalcogenide Quantum Dots
300	<u>Wook Hyun Kim</u> (<i>DGIST</i>), Dae-Hwan Kim, Sungho Woo MgO Coated Mesoporous TiO ₂ for Highly Efficient All-Inorganic CsPbI ₃ Perovskite Solar Cells