



## Asia-Pacific International Conference on Perovskite, Organic Photovoltaics and Optoelectronics (IAPEROP20)

Tsukuba-shi, Japan, 2020 January 20th - 22nd

Conference Chairs: Michio Kondo, Takuro Murakami and Martin A. Green

### Conference Program

January 20th - Day 1 (Monday) 1	
16:00 - 18:30	<b>Registration</b>
17:00 - 18:30	<b>Welcome reception_Room 202</b>
January 21st - Day 2 (Tuesday) 2	
08:00 - 09:00	<b>Registration</b>
08:55 - 09:00	<b>Announcement of the day</b>
08:55 - 09:00	<b>Opening</b>
	<b>Session G1</b> Chair: Michio Kondo Room: Room 202
09:00 - 09:35	
09:35 - 09:45	Discussion
09:45 - 10:10	<u>Tsutomu Miyasaka</u> ( <i>Toin University of Yokohama, Yokohama, Japan</i> )
G1-11	Next generation of perovskite PV with all-inorganic absorbers and dopant-free hole transporters
10:10 - 10:15	Discussion
10:15 - 10:45	<b>Coffee Break</b>
	<b>Session G2</b> Room: Room 202
10:45 - 11:10	<u>TAIHO PARK</u> ( <i>Pohang University of Science and Technology</i> )
G2-11	Thermally Stable, Planar Hybrid Perovskite Solar Cells with High Efficiency
11:10 - 11:15	Discussion
11:15 - 11:40	<u>Tze Chien Sum</u> ( <i>Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore 637371, Singapore</i> )
G2-12	Perovskite Hot Carrier Dynamics
11:40 - 11:45	Discussion
11:45 - 12:10	<u>Udo Bach</u> ( <i>ARC Centre of Excellence in Exciton Science, Department of Chemical Engineering, Monash University, Clayton, VIC, Australia</i> ), Wenxin Mao, Xiongfeng Lin, Siqi Deng
G2-13	Single-Crystalline and Back-Contact Perovskite Optoelectronics
12:10 - 12:15	Discussion
12:15 - 12:40	<u>Hiroko Yamada</u> ( <i>Nara Institute of Science and Technology - Japan</i> )
G2-14	Engineering Thin Films of a Tetrabenzoporphyrin toward Efficient Charge-Carrier Transport
12:40 - 12:45	Discussion
	<b>Industry talks</b> Chair: Peter, Chao-Yu Chen
12:45 - 12:50	<u>Luca Sorbello</u> ( <i>Greatcell Solar</i> )
talks-S1	Hyperion a bright future for solar simulators: The Greatcell Solar Italia way
13:00 - 14:30	<b>lunch</b>



### Session A1

Chair: Udo Bach  
Room: Room 201A

- 14:30 - 14:55 Jung-Yao Chen (*National Chung Cheng University, TW*)  
A1-IS1 Non-Volatile Photomemory with a Ultrafast and Multi-Level Memory Behavior
- 14:55 - 15:00 Discussion
- 15:00 - 15:15 Mohamad I. Nugraha (*King Abdullah University of Science and Technology (KAUST) - Saudi Arabia*), Emre Yarali, Yuliar Firdaus, Yuanbao Lin, Nimer Wehbe, Abdulrahman El-Labban, Emre Yengel, Thomas D. Anthopolous  
A1-O1 Rapid Photonic Curing for the Fabrication of Strongly-Confined Colloidal Quantum Dot Transistors with High Carrier Mobility
- 15:15 - 15:30 Vishwesh Venkatraman (*Norwegian University of Science and Technology (NTNU)*), John de Mello  
A1-O2 Accelerated Design of Photovoltaic Dyes Using Materials Informatics
- 15:30 - 15:45 Ayumi Ishii (*Graduate School of Engineering, Toin University of Yokohama*), Tsutomu Miyasaka  
A1-O3 Highly Efficient Near-Infrared Luminescence of Yb(III) doped Perovskite Thin Films for Light-Emitting Device Applications
- 15:45 - 16:15 **Coffee Break**
- 16:15 - 16:30 Ellie Tanaka (*School of Chemistry, University of Edinburgh*), Hannes Michaels, Marina Freitag, Neil Robertson  
A1-O4 Strategies Towards Efficient and Cost-effective Dye-sensitized Solar Cells

### Session B1

Chair: Taiho PARK  
Room: Room 201B

- 14:30 - 14:55 Ryota Arai (*RICOH Co. Ltd.*)  
B1-IS1 Organic Energy-Harvesting Devices and Modules for Self-Sustainable Power Generation under Ambient Indoor Lighting Environments
- 14:55 - 15:00 Discussion
- 15:00 - 15:15 Begimai Adilbekova (*KSC, KAUST*), Yuanbao Lin, Emre Yengel, Hendrik A. Faber, George Harrison, Yuliar Firdaus, Vincent Tung, Thomas D. Anthopoulos  
B1-O1 Aqueous ammonia-based exfoliation of two dimensional MoS2 and WS2 and their application in non-fullerene organic solar cells
- 15:15 - 15:30 Yuliar Firdaus (*King Abdullah University of Science and Technology (KAUST) - Saudi Arabia*), Qiao He, Yuanbao Lin, Ferry Anggoro Ardy Nugroho, Emre Yengel, Ahmed H. Balawi, Frederic Laquai, Christoph Langhammer, Feng Liu, Martin Heeney, Thomas D. Anthopoulos  
B1-O2 Organic Tandem Solar Cells with 15% Efficiency Employing Novel Wide Bandgap Nonfullerene Acceptor
- 15:30 - 15:45 Emilie Planes, Lara Perrin (*Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, France*), Manon Spalla, Muriel Matheron, Solenn Berson, Lionel Flandin  
B1-O3 Some Aspect of the Stability of Flexible Organic Solar Cells
- 15:45 - 16:15 **Coffee Break**
- 16:15 - 16:30 Namrata Pant (*Interdisciplinary Graduate School of Medicine and Engineering, University of Yamanashi*), Masatoshi Yanagida, Yasuhiro Shirai, Kenjiro Miyano  
B1-O4 Investigating the Effect of Nickel Oxide on the Crystallisation, Optoelectronic Properties and Performance of Perovskite Solar Cells
- 16:30 - 16:45 Teng Ma (*Advanced Institute for Materials Research (WPI-AIMR), Tohoku University, Sendai 980-8577, Japan*), Ayumi Hirano-Iwata  
B1-O5 Boosting the performance of back-contact perovskite solar cells by enlarging crystal size
- 16:45 - 17:00 Chun-Hsiao Kuan (*Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taipei, No. 1, Sec. 4, Roosevelt Road, 10617, Taiwan*), Ching-Fuh Lin  
B1-O6 A Practicable Way Combining Advantages Of Thermal Evaporation And Solution Process To Control Reaction Of MAPbI3 To Fabricate High Crystallization Perovskite



### Session C1

Chair: Tze-Chien Sum  
Room: Room 202

14:30 - 14:55	<u>Shigehiko Mori</u> ( <i>Corporate Research &amp; Development Center, Toshiba Corporation</i> ), Haruhi Ohka, Hideyuki Nakao, Akio Amano, Kenji Todori
C1-IS1	Film-Based Large-area Perovskite Photovoltaic Module Development
14:55 - 15:00	Discussion
15:00 - 15:15	<u>DIMITRIOS RAPTIS</u> ( <i>College of Engineering, Swansea University, Bay Campus, Swansea SA1 8EN UK</i> ), VASIL STOITCHKOV, SIMONE MERONI, CARYS WORSLEY, ADAM POCKET, DAVE WORSLEY, MATTHIEW CARNIE, TRYSTAN WATSON
C1-O4	Enhancing Fully Printable Mesoscopic Perovskite Solar Cells Performance by Increasing Carbon Electrode Conductivity with the Use of Metallic Grids.
15:15 - 15:30	Fanning MENG, Zhu Zhang, <u>Tingli MA</u> ( <i>Kyushu Institute of Technology, Japan</i> )
C1-O5	Interfacial engineering for carbon-based perovskite solar cells
15:30 - 15:45	<u>Ryo Ishikawa</u> ( <i>Saitama University</i> ), Yuma Moriya, Keiji Ueno, Hajime Shirai
C1-O6	Fabrication of perovskite thin-film solar cells with fluorinated passivation layer using a simple one-step spin-coating method without an antisolvent.
15:45 - 16:15	<b>Coffee Break</b>
16:15 - 16:30	<u>Atsushi Kogo</u> ( <i>Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST)</i> ), Tetsuhiko Miyadera, Masayuki Chikamatsu
C1-O3	Composition tuning of organic-inorganic perovskite crystals by post-treatment for high efficiency solar cells
16:30 - 16:45	<u>Richard Murdey</u> ( <i>Kyoto University, Japan</i> ), Minh Anh Truong, Kento Otsuka, Ruito Hashimoto, Tomoya Nakamura, Atsushi Wakamiya
C1-O2	Light Intensity Dependence Study of Mixed-composition Perovskite Solar Cells
16:45 - 17:00	<u>Ganbaatar Tumen-Ulzij</u> ( <i>OPERA, Kyushu University</i> ), Chuanjiang Qin, Toshinori Matsushima, Chihaya Adachi
C1-O1	Detrimental Effect of Excess PbI <sub>2</sub> on the Stability of Perovskite Solar Cells
17:05 - 18:45	<b>Poster Session</b>
19:30 - 22:00	<b>Social dinner</b>



January 22nd - Day 3 (Wednesday) 3

08:55 - 09:00 **Announcement of the day**

**Session G3**

Chair: Hideo Ohkita  
Room: Room 202

09:00 - 09:35 Shuzi Hayase (*i-Powered Energy System Reserach Center, The University of Electro-Communications*)  
G3-K1 Perovskite solar cells with wide band gap and narrow band gap

09:35 - 09:45 Discussion

09:45 - 10:10 Takayuki Negami (*Panasonic Corporation*), Hiroshi Higuchi, Takashi Nishihara, Ryusuke Uchida, Teruaki Yamamoto, Taisuke Matsui, Yukihiro Kaneko

PEROVSKITE PHTOVOLTAIC MODULES FABRICATED by INK JET PRINTING

10:10 - 10:15 Discussion

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

**Session G4**

Chair: Shuzi Hayase  
Room: Room 202

10:45 - 11:10 Maria Antonietta Loj (*University of Groningen - NL*)  
G4-I1 Highly performing tin-based perovskite solar cells: a focus on the thin film quality

11:10 - 11:15 Discussion

11:15 - 11:40 Eric Wei-Guang Diau (*National Chiao Tung University Hsinchu, Taiwan*)  
G4-I2 Lead-free Perovskites for Applications of Photovoltaics and Photocatalysis

11:40 - 11:45 Discussion

11:45 - 12:10 Quentin Jeangros (*École Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), Photovoltaics and Thin-Film Electronics Laboratory (PV-Lab), Switzerland*), Florent Sahli, Peter Fiala, Ricardo A.Z. Razera, Daniel A. Jacobs, Fan Fu, Terry C.-J. Yang, Quentin Guesnay, Xin Yu Chin, Vincent Paratte, Gizem Nogay, Brett A. Kamino, Saeid Rafizadeh, Arnaud Walter, Soo-Jin Moon, Adriana Paracchino, Marion Dussouillez, Laura Ding, Mathieu Boccard, Sylvain Nicolay, Andrea Ingenito, Christophe Ballif  
G4-I3 A nanometric view on performance-loss mechanisms in perovskite/c-Si multi-junction solar cells

12:10 - 12:15 Discussion

12:15 - 12:40 Hideo Ohkita (*Kyoto University, Japan*)  
G4-I4 Charge Recombination Losses in Perovskite Solar Cells

12:40 - 12:45 Discussion

**Industry talks**

Chair: Shuzi Hayase

12:45 - 12:50 Taro Tanabe (*TCl Chemicals*)  
talks-S1 TCl industry talk

12:50 - 12:55 Yanek Hebtng (*Greatcell Solar Materials*)  
talks-S2 Greatcell Solar Materials

13:00 - 14:30 **lunch**

**Session A2**

Chair: Jung-Yao Chen  
Room: Room 201A

14:30 - 14:55 Yoichi Aoki (*Toray Industries, Inc.*), Shuhei Yamamoto, Daisuke Kitazawa  
A2-IS1 Wireless sensor nodes with organic solar cells

14:55 - 15:00 Discussion



- 15:00 - 15:15  
A2-O1 **ELHAM REZASOLTANI** (*Department of Physics and Centre for Plastic Electronics, Imperial College London, London, SW7 2AZ, UK.*), Anne Guilbert, Jun Yan, xabier Rodriguz, Mohammed Azzuzi, Sachetan Tuladhar, Andrew Wadsworth, Iain Mcculloch, Mariano Campoy, Jenny Nelson  
Correlating the Phase Behavior with the Device Performance in Binary P3HT: NFA Blend Using Optical Probes of Microstructure
- 15:15 - 15:30  
A2-O2 **SAFAKATH KARUTHEDATH** (*King Abdullah University of Science and Technology (KAUST) - Saudi Arabia*), Julien Gorenflot, Anastasia Markina, Yuliar Firdaus, Ahmed H. Balawi, Thomas D. Anthopoulos, Denis Andrienko, Frédéric Laquai  
Importance of Energetic Driving Force for Efficient Charge Separation in Non-fullerene Organic Solar Cells
- 15:30 - 15:45  
A2-O3 **Jun Yan** (*Department of Physics and Centre for Plastic Electronics, Imperial College London, London, SW7 2AZ, UK.*), Elham Rezasoltani, Mohammed Azzouzi, Flurin D. Eisner, Anne A. Y. Guilbert, Jenny Nelson  
Relating Microstructure Behaviour to Charge Transfer States Properties and Energy Losses in Organic Bulk Heterojunction Solar Cells
- 15:45 - 16:15 **Coffee Break**
- 16:15 - 16:30  
A2-O4 **Zhengfei Wei** (*SPECIFIC, College of Engineering, Swansea University, Bay Campus, Swansea, SA1 8EN, UK*), Benjamin Smith, Amirah Way, Vasil Stoichkov, Francesca De Rossi, Harrison Ka Hin Lee, Jérémy Barbé, Wing C. Tsoi, Justin Searle, David Worsley, Trystan Watson  
Room-temperature Processed Transparent Conductive Oxides For Efficient And Semi-transparent Perovskite And Organic Solar Cells
- 16:30 - 16:45  
A2-O5 **Mario Leonardus** (*Institute of Chemistry, Academia Sinica, Nankang, Taipei 11529 Taiwan*), Chen-Hsiung Hung  
The Effect of Light-Harvesting Property of Oxasmaragdyrin and Its Impact as Hole Transporting Material in Perovskite Solar Cell
- 16:45 - 17:00  
A2-O6 **Ece Aktas** (*Institute of Chemical Research of Catalonia-The Barcelona Institute of Science and Technology (ICIQ-BIST), Avda. Països Catalans 16, 43007 Tarragona, Spain*), Jesús Jiménez-López, Emilio Palomares  
Self-Assembled Hole Transporting Monolayer to Improve PiN Type Perovskite Solar Cell Performance

### Session B2

Chair: Quentin Jeangros  
Room: Room 201B

- 14:30 - 14:55  
B2-IS1 **Takeru Bessho** (*Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan*)  
Material Amelioration of Organometal Halide Perovskite by Potassium-doping and Its Efficient Photovoltaics
- 14:55 - 15:00 Discussion
- 15:00 - 15:15  
B2-O1 **Haibin Wang** (*Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan*), Takaya Kubo, Jotaro Nakazaki, Hiroshi Segawa  
Enhance Infrared Photocurrent of PbS Quantum Dot Solar Cells toward the Bottom Subcell of Multi-junction Solar Cells
- 15:15 - 15:30  
B2-O2 **Cheng-Hung Hou** (*Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan.*), Shu-Han Hung, Jing-Jong Shyue, Pi-Tai Chou  
Revealing Performance Governing Factors of Perovskite Solar Cells via Artifact-Free ToF-SIMS Depth Profiles
- 15:30 - 15:45  
B2-O3 **Lara Perrin** (*LEPMI / CNRS UMR 5279 / Université Savoie Mont Blanc*), Manon Spalla, Emilie Planes, Muriel Matheron, Solenn Berson, Lionel Flandin  
Gold electrode mitigation impact: elucidation of both degradation and safeguard mechanisms in a mixed-ion perovskite solar device
- 15:45 - 16:15 **Coffee Break**
- 16:15 - 16:30  
B2-O4 **Shinichi Magaino** (*Kanagawa Institute of Industrial Science and Technology (KISTEC), Kawasaki, Japan*), Hidenori Saito, Daisuke Aoki, Tomoyuki Tobe  
Standardization of Measurement Protocols for Photovoltaic Devices Exhibiting Complex Current Response to Applied Voltage



- 16:30 - 16:45 B2-O5 Afsal Manekkathodi, Bin Chen, Junghwan Kim, Se-Woong Baek, Benjamin Scheffel, Yi Hou, Olivier Ouellette, Makhstud Saidaminov, Oleksandr Voznyy, Vinod Madhavan, Abdelhak Belaidi, Sahel Ashhab (*Qatar Environment and Energy Research Institute, Hamad Bin Khalifa University, Doha*), Edward Sargent  
Solution-processed Perovskite-colloidal Quantum Dot Tandem Solar Cells for Photon Collection Beyond 1000 nm
- 16:45 - 17:00 B2-O6 Jun-Yu Huang (*Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University*), En-Wen Chang, Yuh-Renn Wu  
Analysis of Hysteresis Effect and Modeling of Ion Migration in Perovskite Solar Cells

### Session C2

Chair: Ellie Tanaka  
Room: Room 202

- 14:30 - 14:55 C2-IS1 Simone Mastroianni (*Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstraße 2, D-79110 Freiburg, Germany*), Lukas Wagner, Gayathri Mathiazhagan, Dmitry Bogachuk, Kübra Yasaroglu Ünal, Shankar Bogati, Thomas Kroyer, Michael Daub, Harald Hillebrecht, Jean-Luc Rehspringer, Aziz Dinia, Andreas Hinsch  
Towards a Sustainable Energy Future: Fully Printable Carbon-Based Perovskite Solar Cells with Overcome Charge Transport Limitation and Improved Light-Harvesting Efficiency
- 14:55 - 15:00 Discussion
- 15:00 - 15:15 C2-O1 Muhammad Akmal Kamarudin (*i-Powered Energy System Reserach Center, The University of Electro-Communications*), Daisuke Hirovani, Zhen Wang, Kengo Hamada, Kohei Nishimura, Qing Shen, Satoshi Iikubo, Takashi Minemoto, Kenji Yoshino, Shuzi Hayase  
Lead-free tin halide perovskite solar cells beyond 10 % efficiency
- 15:15 - 15:30 C2-O2 Satoshi Uchida (*Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan*), Ludmila Cojocar, Hiromi Tobita, Viraji Jayaweera, Shoji Kaneko, Hiroshi Segawa  
Evaluation of interface junction capacitance of perovskite solar cells by direct current measurement
- 15:30 - 15:45 C2-O3 Tianhao Wu, Xiao Liu (*Photovoltaic Materials Group, Center for Green Research on Energy and Environmental Materials, National Institute for Materials Science (NIMS)*), Liyuan Han  
Efficient and Stable Tin Perovskite Solar Cells by Introducing  $\Pi$ -conjugated Lewis Base
- 15:45 - 16:15 **Coffee Break**
- 16:15 - 16:30 C2-O4 Adam Wright (*University of Oxford, Department of Physics, Clarendon Laboratory, Parks Road, Oxford, OX13PU, UK*)  
Band-tail trapping in FAPbI3 perovskite
- 16:30 - 16:45 C2-O5 Yajun Gao (*King Abdullah University of Science and Technology (KAUST) - Saudi Arabia*), Kai wang, mingcong wang, Jafar Khan, Ahmed Balawi, Stefaan Wolf, Frederic Laquai  
Revealing the Impact of Cesium/Rubidium Incorporation on the Photophysics of Multiple-Cation Lead Halide Perovskites

### Session G5

Chair: Takuro Murakami  
Room: Room 202

- 17:00 - 17:40 G5-K1 Henry Snaith (*University of Oxford, Department of Physics, Clarendon Laboratory, Parks Road, Oxford, OX13PU, UK*)  
Perovskite solar cells: materials, devices and industrialization
- 17:40 - 17:45 Discussion
- 17:45 - 18:00 **Closing ceremony and poster awards\_Room 202**



## Poster Contribution

021	<u>Said Kazaoui</u> ( <i>Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan</i> ) KI Post-Treatment Improves the Performances of Perovskite Solar Cells
060	<u>Chongyang Xu</u> ( <i>Department of Nano-Physics, Gachon University</i> ), Eun-Cheol Lee Morphology Control of SnO <sub>2</sub> Layer for Efficient Perovskite Solar Cells through a Solvent Engineering Strategy
062	<u>Dhruba B. Khadka</u> ( <i>International Center for Young Scientists (ICYS), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan.</i> ), Yasuhiro Shirai, Masatoshi Yanagida, Kenjiro Miyano Mitigation of the Recombination Activities with Rubidium incorporation for Efficient and Stable FASnI <sub>3</sub> Solar Cells
063	<u>Ying-Chiao Wang</u> ( <i>International Center for Young Scientists (ICYS), National Institute for Materials Science (NIMS)</i> ), Kazuhito Tsukagoshi Silicon-Based Quantum Dot-Assisted Photoelectric Effect in Perovskite Solar Cells
066	<u>Yung-Chung Chen</u> ( <i>Department of Chemical and Materials Engineering, National Kaohsiung University of Science and Technology</i> ), Yan-Heng Li, Chung-Lin Chung, Hsiang-Lin Hsu, Chih-Ping Chen Methoxy substituents effect in triphenylamine dibenzofulvene based hole transporting materials for dopant free p-i-n perovskite solar cells
067	<u>Md. Shahiduzzaman</u> ( <i>Nanomaterials Research Institute (NanoMaRI), Kanazawa University</i> ), Ashish Kulkarni, Masahiro Nakano, Makoto Karakawa, Kohshin Takahashi, Shinjiro Umezu, Atsushi Masuda, Satoru Iwamori, Masao Isomura, Koji Tomita, Tsutomu Miyasaka, Tetsuya Taima Brookite TiO <sub>2</sub> Nanoparticle Bridge Boosts the Stability of Perovskite Solar Cells
069	Thibault Lemerrier, <u>Lara Perrin</u> ( <i>Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, 38000 Grenoble, France</i> ), Emilie Planes, Solenn Berson, Lionel Flandin Inverted Perovskite Solar Cells: Influence of Anti-Solvent Nature and Dripping Time on Perovskite Layer Properties and Uniformity
070	<u>Nilesh Manwar</u> ( <i>Chemical and Material Sciences Division, CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun, India-248005</i> ), SumanLata Jain, Nitin Labhasetwar Crystallization and Impact of B-site metal cation substitution of Lead Free Organic-Inorganic Cu (II) Perovskites structure and its optical properties
071	<u>Issei Takenaka</u> ( <i>Advanced Technology Research Laboratories, Idemitsu Kosan Co.,Ltd., 123-1 Shimokawairi, Atsugi, Kanagawa 243-0206, Japan</i> ), Motoshi Nakamura, Yoshinori Kimoto, Yuta Higashino, Hiroki Sugimoto, Naoyuki Shibayama, Chie Nishiyama, Keishi Tada, Takeru Bessho, Hiroshi Segawa Room-Temperature Sputtered SnO <sub>2</sub> Thin Film as an Electron Transport Layer for Mixed-Cation Planar Heterojunction Perovskite Solar Cells
072	<u>Ching Chang Lin</u> ( <i>University of Tokyo, Japan</i> ), Takuro N. Murakami, Masayuki Chikamatsu, Takeru Bessho, Hiroshi Segawa A Facile Ionic Compound Modification of SnO <sub>2</sub> ETL to Enhance the Performance Perovskite Solar Cell
073	<u>Ryuji Kaneko</u> ( <i>College of Science and Technology, Nihon University</i> ), Joe Otsuki, Md. Khaja Nazeeruddin, Ashrafal Islam Surface Modified NiOx Nanoparticles as Hole Transport Materials in n-i-p Structured Perovskite Solar Cells
074	<u>Shuzhang Yang</u> ( <i>State Key Laboratory of Fine Chemicals, School of petroleum and chemical engineering, Dalian University of Technology, Panjin, 124221, China.</i> ), Zhanglin Guo, Liguao Gao, Tingli Ma Bifunctional Dye Molecule in All-Inorganic CsPbI <sub>3</sub> Perovskite Solar Cells with Efficiency Exceeding 10%
075	<u>Liang Wang</u> ( <i>Kyushu Institute of Technology, Japan</i> ), Shuzhang Yang, Fengjing Liu, Chao Jiang, Tingli Ma A New Strategy of Methylamine Iodide Solution Assisted Repair for Pinhole-Free Perovskite Films in High-Efficiency Photovoltaic under Ambient Conditions
076	<u>Takeyuki Sekimoto</u> ( <i>Panasonic Corporation, Osaka 570-8501, Japan.</i> ), Michio Suzuka, Tomoyasu Yokoyama, Yoshiko Miyamoto, Ryusuke Uchida, Maki Hiraoka, Kenji Kawano, Takashi Sekiguchi, Yukihiko Kaneko Inverse Temperature Crystallization of Formamidinium Tin Iodide



- 077 Masatoshi Yanagida (*Center for Green Research on Energy and Environment Materials, National Institute for Materials Science (NIMS), 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, Japan.*), Namrata Pant, Yasuhiro Shirai, Kenjiro Miyano  
RF Sputtered NiOx as Hole Transport Layer for CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Perovskite Solar Cell
- 078 Takashi Koida (*Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, Japan*), Hitoshi Sai, Jiro Nishinaga  
High-Mobility Transparent Conductive Oxide Films Fabricated under Low-Energy Ion Bombardment at Low Temperature
- 080 Chao Ding, Xing Lin (*The University of Electro-Communications, Japan*), Feng Liu, Yaohong Zhang, Daisuke Hirotsu, Taro Toyoda, Shuzi Hayase, Takashi Minemoto, Taizo Masuda, Kenji Katayama, Qing Shen  
Photoexcited Hot and Cold Electron and Hole behavior at FAPbI<sub>3</sub> Perovskite Quantum Dots/Metal Oxide Heterojunctions: Hot versus Cold Charge-relaxation and transfer
- 081 Kentaro Kawabata (*The University of Electro-Communications*), Feng Liu, Chao Ding, Yaohong Zhang, Qing Shen, Shuzi Hayase, Taro Toyoda  
Colloidal Synthesis of Air-Stable Alloyed CsSn<sub>1-x</sub>PbxI<sub>3</sub> Perovskite Nanocrystals for Use in Solar Cells
- 082 Dong Liu (*The University of Electro-Communications, Japan*), Yaohong Zhang, Naoki Nakazawa, Chao Ding, Feng Liu, Taro Toyoda, Shuzi Hayase, Qing Shen  
The Interparticle Distance Limit for Multiple Exciton Dissociation in PbS Quantum Dot Solid Films
- 083 Gayathri Mathiazhagan, Lukas Wagner, Shankar Bogati, Kübra Yasaroglu Ünal, Thomas Kroyer, Simone Mastroianni (*Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstraße 2, D-79110 Freiburg, Germany*), Andreas Hinsch  
Double-Mesoscopic H<sub>2</sub>M-Free Perovskite Solar Cells: Overcoming Charge Transport Limitation by Sputtered 40 nm Al<sub>2</sub>O<sub>3</sub> Isolation Layer
- 084 Daisuke Aoki (*Kanagawa Institute of Industrial Science and Technology (KISTEC), Kawasaki, Japan*), Hidenori Saito, Tomoyuki Tobe, Shinichi Magaino  
Steady-state Measurement of Maximum Power for Perovskite Solar Cell
- 085 Rojas Tarazona Fredy Enrique (*Pontificia Universidad Javeriana*), Diaz-Granados Fabian, Méndez Henry, Salcedo Juan Carlos, Rodríguez Hernán, Mejía Augusto, Jiménez Luis Camilo  
Optical and Electrical Properties of a Prototype of Organic Solar Cell Based on P3HT:PCBM
- 086 Hidenori Saito (*Kanagawa Institute of Industrial Science and Technology (KISTEC), Kawasaki, Japan*), Daisuke Aoki, Tomoyuki Tobe, Shinichi Magaino  
Development the Measurement Method for Maximum Power of Metastable Perovskite Solar Cells.
- 087 Nobuko Onozawa-Komatsuzaki (*National Institute of Advanced Industrial Science and Technology (AIST)*), Yoshihiko Nishihara, Masayuki Chikamatsu, Yuji Yoshida  
Effect of FABr Passivation on the Interface of Perovskite/hole-transporting Layer on Perovskite Solar Cells with Donor-Acceptor Conjugated Polymer
- 088 Tetsuhiko Miyadera (*National Institute of Advanced Industrial Science and Technology (AIST)*), Yuto Auchu, Kohei Yamamoto, Noboru Ohashi, Tomoyuki Koganezawa, Hiroyuki Yaguchi, Yuji Yoshida, Masayuki Chikamatsu  
Crystal Growth Control and Real-Time Analysis of Organolead-Halide Perovskite
- 089 Seojun Lee (*School of Energy Systems Engineering, Chung-Ang University, Seoul, 06974, Republic of Korea*), Saemon Yoon, Jun Ryu, Dong-Won Kang  
Additive Engineering of Sn-based Perovskites for Efficient Pb-free Solar Cells
- 090 Koichiro Kamimori (*Department of Applied Chemistry and Research Institute for Science and Engineering, Waseda University, 169-8555, Japan*), Koki Suwa, Takeo Suga, Kenichi Oyaizu, Hiroshi Segawa, Hiroyuki Nishide  
Metal-dopant-free Hole-transporting Poly(triarylamine)s for a Durable Perovskite Solar Cell
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