



JPH 2024

Journées Perovskites Halogénées



3 au 5 Avril 2024



Aix-les-Bains, Savoie France

Scientific Program

Wednesday, April 3 rd	
13h30 - 14h30	Welcome registration
14h30 - 14h45	Opening of JPH 2024 <i>Solenn BERSON- Malek BENMANSOUR</i>
14h45 - 15h45	Tutorial 1 : Muriel BOUTTEMY (Institut Lavoisier Versailles, France) XPS (X-ray photoelectron Spectroscopy): a powerful technique for investigating surface and interface chemistry of perovskite-based solar cells.
15h45 - 16h15	Coffee Break
16h15 - 17h15	Tutorial 2 : Adrien RIVALLAND (CEA/LITEN INES, Grenoble, France) Stability of perovskite-based solar devices
17h15 - 17h45	Sponsors presentations
18h00 - 19h30	Poster session
20h00 - 22h00	Diner

Thursday, April 4 th	
Session 1: Synthesis and fundamental properties	
09h00 - 09h30	Invited Speaker 1 : Carole DIEDERICHS (Sorbonne Université, Paris, France) Individual perovskite nanocrystals coupled to an optical fibered microcavity
09h30 - 10h30	Oral 1.1 : Zhuoying CHEN (ESPCI) Colloidal Nanocrystals for More Stable Perovskite Solar Cells Oral 1.2 : Clémence CAZALS (MOLTECH-Anjou, Université d'Angers) Excitation-dependent photoluminescent hybrid iodocuprates compounds Oral 1.3 : Cédric R. MAYER (ENS- Université PARIS Saclay) Influence of Arylalkyl Amines on the Formation of Hybrids CsPbBr ₃ Nanocrystals via Modified LARP Method.
10h30 - 11h00	Coffee Break

11h00 - 11h30	Invited Speaker 1 : Michal BARANOVSKI (University of Science and Technology, Wroclaw, Poland) Exciton-phonon coupling: Unraveling the Driving Force Behind Perovskite optical Response
11h30 - 12h30	Oral 1.4 : Min LIU (IRCP ChimieParisTech) 2D Halide Perovskite Phase Formation Dynamics and their Regulation by Co-Additives Oral 1.5 – Olivier PLANTEVIN (Université Paris Saclay) Defect engineering in Mixed Halide Perovskites with Ion Irradiation Oral 1.6 – Lauriane SCHERRER (EDF / ENS - Université PARIS Saclay) Development of an inorganic perovskite absorber on a large surface in open air
12h45 - 14h00	Lunch
14h00 - 15h00	Poster session
Session 3: Optoelectronic devices	
15h00 - 15h30	Invited Speaker 3 – Diego DI GIROLAMO (3SUN – ENEL, Italy) Reliability and Energy Yield of Silicon/Perovskite Tandem Solar Cells. The Case of Reverse Bias
15h30 - 16h30	Oral 3.1 : Jakob IHRENBERGER (CEA/LITEN) Solution Free Growth of CsPbBr ₃ Perovskite Films using a Fast and Scalable Close Space Sublimation method Oral 3.2 : Marie CRESP (IRCP / Chimie-Paristech) New Approach to quantify Cation Elimination upon Thermal Annealing in Two-Dimensional Halide Perovskite Layers for Solar Cells Oral 3.3 : Amina LABIOD (CEA/LITEN) Towards all-perovskite tandem flexible modules: Status and challenges
16h30 - 17h00	Coffee Break
17h00 - 17h30	Invited Speaker 3: Salvador ESLAVA (Imperial College, London, UK) Extending the Success of Halide Perovskites from Solar Cells to Photoanodes and Photocatalysts for Solar Fuels
17h30 - 18h30	Oral 3.4 : Elsa PARRAT (CEA/LETI) Pulsed laser deposition of Inorganic halide perovskite thin films for micro-LEDs fabrication. Oral 3.5 : Tam Trong NGUYEN (Ecole Centrale Lyon) Nanophotonic engineering of perovskite metasurface LEDs Oral 3.6 : Baptiste ROSELLI (EDF / ENS - MONARIS - Sorbonne Université) Synthesis of Cesium lead halide perovskite nanoparticles for application in light-emitting electrochemical cells (LECs)
20h00 - 22h00	Diner Gala

Friday, April 5th

Session 2: Characterization & modelisation/simulation	
08h30 - 09h00	Invited Speaker2 : Maria ANTONIETTA LOI (University of Groningen Netherlands) Hot carrier relaxation in Sn-based perovskites
09h00 - 10h30	Oral 2.1 : Romain GAUTIER (IMN/ Nantes) Hydrogen Bonding of New Low Dimensional Hybrid Perovskites Unravelling by Machine Learning Oral 2.2 : Eric GROS-DAILLON (CEA/LETI) Unveiling Ionic Migration Pathways in Thick CsPbBr ₃ under Electric Field: Insights from Grazing Incidence X-ray Fluorescence Oral 2.3 : Guillaume LAGUE (Institut Nanosciences - PARIS Sorbonne) Spin dephasing and relaxation times of charge carriers in FAPbI ₃ polycrystalline films Oral 2.4 : Shadi ALARAB (CEA/IRIG) Probing surface chemistry of halogenated perovskite nanocrystals using NMR and Dynamic Nuclear Polarization
10h30 - 11h00	Coffee Break
11h00 - 11h30	Invited Speaker 2 – Felix LANG- University of Potsdam (Germany) Understanding and Optimizing Perovskite based Tandem PV based Space PV
11h30 - 12h30	Oral 2.5 : Polyxeni TSOULKA (CEA/LITEN) Chemical and structural characterization of Perovskite thin films fabricated by Close Space Sublimation for upscaling Si/Perovskite tandem devices Oral 2.6 : Géraud DELPORT (Ecole Polytechnique) Optical properties of air stable mixed valence gold double perovskites for infrared optoelectronic applications. Oral 2.7 : Nao HARADA (IPVF) Characterization by Hyperspectral Photoluminescence Imaging of Fully scalable Perovskite Solar Cells Using Slot-Die Processes
12h30 - 13h00	Closing Session : Solenn BERSON and Malek BENMANSOUR Communications prizes : Emmanuelle DELEPORTE
12h45 - 14h00	Take away Lunch

With the support of



ines
INSTITUT NATIONAL
DE L'ENERGIE SOLAIRE



GDR Groupement
de recherche
HPERO Halide perovskites



POSTER session

- **P1** - Morphological and optoelectrical characterization of MAPbBr₃ films and solar cells and influence of the sub-layer (Hindia NAHDI, CEA)
- **P2** - In-situ Temperature Monitoring of Perovskite Solar Cells Degraded under Illumination (Zhuoying CHEN, Sorbonne University)
- **P3** - Synergetic Exterior and Interfacial Approaches by Colloidal Carbon Quantum Dots for More Stable Perovskite Solar Cells Against UV (Dongjiu ZHANG, Sorbonne University)
- **P4** - Breaking the Boundaries of Perovskite Solar Cell Testing: A Practical Examination of the All-In-One Pico™ LED Solar Simulator for Indoor and Outdoor Characterization (Jean-Paul GASTON, OPTON laser)
- **P5** - Up-scaling Perovskite growth using hybrid methods for Si/Perovskite tandem solar cells (Kristell CARRERIC, CEA)
- **P6** - Impact of self-assembled monolayers as hole transport layers in a mixed MA free Pb/Sn perovskite solar cell (Jules ALLEGRE, CEA)
- **P7** - Scalable Room Temperature Pulsed Laser Deposition of NiO_x Hole Transport Layer in P-I-N Perovskite Solar Cells: Achieving High Fill-Factor without Interface Layer (Kilian ALCOGER, CEA)
- **P8** - Development of perovskite solar cells based on quantum dots (Fatou DIAW-NDIAYE, LEPMI)
- **P9** - Electrodeposition of perovskite for carbon-based solar cells architecture: Impact of 5-AVAL on the traditional MAPbI₃ perovskite (Romain LAVOPIERRE, LEPMI)
- **P10** - Scalable Solution-Processed Hole Transport Layer for Efficient Inverted methylammonium-free Wide Band Gap Perovskite Solar Cells (Yassine RAOUI, CHOSE)
- **P11** - L'effet de l'introduction des monocouches auto-assemblées et l'orientation de la couche Transporteuse de trous sur les performances des cellules inverses à base de pérovskite hybride (Mohamed Ali ALAOUI, Université Paris Cité)
- **P12** - Sn/Ge-based lead-free halogenated perovskite materials for photovoltaic applications: synthesis, structural properties and stability (Ranin BAREK, CEA)
- **P13** - Physicochemical Interface Control of Metal Oxides through SAMs: Application to Halide Perovskite-Based Photovoltaic Cells (Balkis NASRAOUI, ITODYS)
- **P14** - Effect of terminal groups in phosphonic acid Carbazole based molecules as Self-Assembled Monolayers for perovskite solar cells (Yahya HAMI, ITODYS)
- **P15** - Study of passivation mechanism: formation of inorganic Ruddlesden-Popper phase on perovskite solar cells treated by cesium chloride? (Thomas GOMES, CEA)
- **P16** - Effect of Octahedral Distortion on Carrier Effective Masses in 2D perovskites (Paulina PESKA, LNCMI Toulouse)
- **P17** - Unraveling the excitonic landscape in hybrid organic-inorganic 2D silver chalcogenolates (Katarzyna POSMYK, Wroclaw University)
- **P18** - Hybrid Optoelectronic Device Exploiting Quasi-2D Ruddlesden-Popper Perovskite & Graphene (Wei ZHOU, Sorbonne University)
- **P19** - Introduction of Manganese atoms in 2D perovskite (Linh K. LE, Institut Néel)
- **P20** - Flexible and Efficient Semi-Empirical DFTB methods for Electronic Structure Prediction of 3D, 2D Perovskites and Heterostructures (Junke JIANG, FOTON)
- **P21** - Lamellar hybrid materials with solid-solid phase transitions for thermal energy storage (Come ARCHINARD, IMN)
- **P22** - Quasi 3D electronic structures of Dion-Jacobson layered perovskites with exceptional short interlayer distances (Maria MANIADI, Moltech Anjou)
- **P23** - Exploring the charge transport properties of MAPbBr₃ single crystals using X-ray induced photocurrent measurements at zero-bias (Ferdinand LEDEE, CEA)

- **P24** - Solution-Based Fabrication of Homogeneous All-Inorganic Perovskite Thin Films by Recrystallization (Trong Tam NGUYEN, EC Lyon)
- **P25** - Theoretical prediction of positron lifetimes in methylammonium lead iodide (Guido ROMA, CEA)
- **P26** - Inelastic Coherent Neutron Scattering in Orthorhombic Phase CsPbBr₃: First-principles Insights (Zeli XU, FOTON)
- **P27** - Positron lifetime in lead bromide perovskite : delocalization versus capture at defects depending on composition and preparation (Catherine CORBEL, CEA)
- **P28** - Impact of the chemical composition on the structural, dielectric and dynamic properties of inorganic halide perovskites: towards a stable (AA')(BB')(XX')₃ (Antoine GISSLER, EDF-IPVF)
- **P29** - Photoluminescence spectroscopy of localized emitters in CH₃NH₃PbI₃ Single Crystals (Thi Huyen Trang NGUYEN, GEMAc)
- **P30** - Exciton in halide perovskite nanoplatelets : Finite confinement and dielectric effects in the effective mass approximation (Kouther TLILI, Sorbonne University)

INVITED Speakers

SESSION 1 : Synthesis and fundamental properties of perovskite materials

Carole Diederichs, Sorbonne university Paris



Carole Diederichs is an Associate Professor at Sorbonne University and works in the Nano-Optics group of the Physics Laboratory of Ecole Normale Supérieure (LPENS). After a PhD on exciton-polaritons in semiconductor microcavities at Laboratoire Pierre Aigrain, and a postdoc in the USA at MIT, she joined LPENS in 2008, where she works on optical spectroscopy of semiconductor quantum dots for single photon emission applications. Her research focused mainly on InAs/GaAs quantum dots until 2016. After 3 years in Singapore as Visiting Associate Professor at Nanyang Technological University (NTU) and as a member of MajuLab (CNRS IRL), where she studied emergent materials for optoelectronics such as lead halide perovskite, she developed a new activity at LPENS on perovskite nanocrystals coupled to photonic structures for the demonstration of cavity quantum electrodynamics effects with these new quantum emitters. In 2022, she was appointed Junior Member of the IUF for 5 years.

Michał Baranowski, University of Science and Technology Wrocław



Wrocław University
of Science and Technology

Michał Baranowski Since 2015, he has held a permanent position as an Assistant Professor in the Department of Experimental Physics at WUST. Since 2016, he has been a visiting scientist at LNCMI-CNRS Toulouse, working with the head of the Quantum Electronics group Paulina Plochocka. His main scientific interest is the optical spectroscopy of emerging semiconducting materials. In the last years, his activity has been focused on the rapidly expanding research fields of 2D materials and metal-halide perovskites

SESSION 2: Perovskite material characterization, modelisation and simulation

Maria Antonietta Loi, University of Groningen



university of
 groningen

Maria Antonietta Loi studied physics at the University of Cagliari in Italy where she received the PhD in 2001. In the same year she joined the Linz Institute for Organic Solar cells, of the University of Linz, Austria as a postdoctoral fellow. Later she worked as researcher at the Institute for Nanostructured Materials of the Italian National Research Council in Bologna, Italy. In 2006 she became assistant professor and Rosalind Franklin Fellow at the Zernike Institute for Advanced Materials of the University of Groningen, The Netherlands. She is now full professor in the same institution and chair of the Photophysics and OptoElectronics group. She has published more than 280 peer-reviewed articles on photophysics and optoelectronics of different types of materials. In 2013 she has received an ERC Starting Grant and in 2022 and ERC Advanced Grant from the European Research Council. She currently serves as deputy editor-in-chief of Applied Physics Letters and she is member of the international advisory board of several international journals in physics and materials physics. In 2018 she received the Physicaprijs from the Dutch physics association for her outstanding work on organic-inorganic hybrid materials. In 2020 she became fellow of the American Physical Society. In 2022 she was elected fellow of the Dutch Academy of Science (KNAW). In the same year she became fellow of the European Academy of Science (EURASC) and of the Royal Society of Chemistry.

Felix Lang, University of Potsdam



Universität Potsdam

Felix Lang leads the (*Radiation-*) *Tolerant Electronics with Soft Semiconductors (ROSI)* Group within the Physics and Optoelectronic of Soft Matter Department at the University of Potsdam. He studied Physics at the Technische Universität München and the Freie Universität Berlin. He received his Ph.D. in physics from the Technical University Berlin, studying the stability and degradation of perovskite solar cells, which he conducted at the Helmholtz-Zentrum Berlin. He was then awarded a Feodor-Lynen Fellowship, which brought him to the group of Prof. S. Stranks from the Cavendish Laboratory at the University of Cambridge, UK, where he tested and developed next-generation perovskite tandem photovoltaics for space photovoltaics. With a return Fellowship from the Alexander von Humboldt Foundation he then came to the University of Potsdam, where he focused on a deeper understanding of the degradation-, working- and loss mechanisms of perovskite-based tandem photovoltaics. Recently he was awarded a Freigeist-Fellowship of the Volkswagen Stiftung, and currently, he is heading the *Tolerant Electronics with Soft Semiconductors Group* at the University of Potsdam.

SESSION 3 : OPTOELECTRONIC DEVICES

Diego Di Girolamo, ENEL/3SUN



Diego Di Girolamo is a research scientist in the 3Sun Gigafactory from Enel Green Power. The 3Sun gigafactory will be the largest solar cells and modules in 2024, with a planned capacity of 3GW. Here, Diego is part of the Advanced R&D team, also developing industrial processes to bring into the market the tandem technology. Diego holds a PhD in chemical science and did research on perovskite photovoltaics, including lead free tin base perovskites and wide bandgap solar cells for building integrated photovoltaics.

Salvador Eslava



**Imperial College
London**

Dr Salvador Eslava is a Reader (Assoc. Prof.) in the Department of Chemical Engineering at Imperial College London, UK. He joined Imperial in 2019 after five years as a Lecturer (Asst. Prof.) at University of Bath, UK. He currently holds an EPSRC Fellowship on Interface Engineering for Solar Hydrogen and was recently awarded the Warner prize from the Institution of Chemical Engineers (IChemE). Before Bath, he was a research associate in the Materials Department at Imperial College London (2011-2014) working with Prof. E. Saiz on graphene and MOFs and in the Chemistry Department at The University of Cambridge (2008-2011), working with Professors Dominic Wright and Richard Lambert on titanium clusters. He defended his PhD degree in 2009 conducted in the Centre for Surface Chemistry and Catalysis (COK) at Katholieke Universiteit Leuven and IMEC, Belgium, in the group of Prof. Johan Martens working on zeolitic dielectrics. He holds a Taught Master in Materials Science from Università degli Studi di Pavia, Italy, and an MEng in Chemical Engineering from Autonomous University of Barcelona, Spain. He has published more than 75 articles in leading journals such as Nat. Commun. and Adv. Mater. and has received £3m funding from EPSRC, The Royal Society, and Innovate UK.

TUTORIAL

Muriel Bouttemy



Muriel Bouttemy is a research engineer in the Electrochemistry and Physico-chemistry at Interfaces (EPI) team at the Institut Lavoisier de Versailles (ILV) since 2009. She holds a doctorate in Molecular physico-chemistry. Her research field of interest concerns advanced chemical and structural analyses of materials and devices, mainly operated by electron spectroscopies (XPS, X-AES, Auger, SEM/EDS/EBSD). She develops metrological approaches to assess possible measurement artefact inherent to these techniques, in particular by studying how UHV conditions and material/beam interactions (beam = X-rays, electrons or ions) affect the reliability of the obtained information. She also develops analytical strategies to reach deeply buried interfaces. These aspects as well as rigorous data treatment are fundamental. She has a strong expertise on a large panel of technological brick for photovoltaic applications among them perovskite active layers and ad-layers.

Adrien Rivalland, CEA



Ph.D. in Physics since 2020, I began my career developing and characterising Si/CuGaSe₂ tandem solar cells during my thesis and initial post-doctoral appointment at the Jean-Rouxel Institute of Materials (IMN) in Nantes, France. Following this, I joined the CEA at INES (French Alternative Energies and Atomic Energy Commission) within the Tandem Cells Laboratory (LCT) to investigate stability issues in Si/perovskite tandem devices. My work primarily revolves around the examination of tandem cells' performance under illumination in laboratory and real-world conditions, the comprehension of degradation mechanisms at play, and the adaptation of studied devices to enhance their long-term stability.

With the support of

