



Spring Meeting 2021

May 31- June 4 | Virtual Conference

E-MRS Spring Meeting 2021

Symposium E: Exotic materials and innovative concepts for photovoltaics

Symposium organizers

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The success story of hybrid perovskite solar cells confirms that research on novel photovoltaic materials can produce outstanding breakthroughs. This clearly strongly supports the organization of an E-MRS symposium on novel and emerging materials and concepts for photovoltaics which will serve to make E-MRS a leader in the world in new energy materials.

Scope

This symposium will address fundamental and applied research on innovative photovoltaics materials and device integration. The focus will be on non-conventional photovoltaics, or conventional photovoltaics but with a radically new approach. Novel materials such as exotic silicon, oxides or multinary compounds, novel organic/inorganic materials will be included. It should be noted that inorganic perovskites have reached a conversion efficiency of 14.3% in 2020 (CsPbI₃). All third generation and emerging concepts such as multiple carrier generation, hot carrier and intermediate band solar cells, upconversion and downconversion are of increasing relevance and will be discussed. Novel experimental synthesis and characterization techniques

are of interest in this symposium. Novel contacting and packaging approaches are also of interest. Theoretical calculations of novel materials or emerging concepts are also relevant. Theoretical approaches on novel absorbers and concepts are fundamental to give directions to experimentalists in the field of photovoltaics.

Hot topics to be covered by the symposium

Emerging solar cell absorbers
Computational design of novel materials or concepts
Novel solar cell devices
Oxide solar cells
Bulk photovoltaics and photogalvanic effects
Organic and hybrid solar cells
Exotic forms of silicon
Downshifting, downconversion, upconversion
Multiple carrier generation
Intermediate band solar cells
Hot carrier solar cells
Transparent conductive oxides
Innovative characterization techniques
New contacting and packaging approaches
New module approaches

List of invited speakers

- Reuben Collins, Colorado School of Mines, USA, "A cage-like crystalline silicon allotrope - electron paramagnetic resonance studies of silicon clathrates with low Na content"
- Gitti Frey, Technion, Israel "3D Imaging and tomography of organic solar cells"
- Jan Christoph Goldschmidt, Fraunhofer ISE, Germany "Materials for perovskite silicon tandem solar cells"
- Robert Hoyer, Imperial College London, UK, "Investigating $\text{Cs}_2\text{Ag}(\text{Sb}_x\text{Bi}_{1-x})\text{Br}_6$ Double Perovskite Alloys as Lead-Free Solar Absorbers"
- Laurent Lombez, LPCNO-CNRS, France, "Multidimensional luminescence imaging techniques for the development of advanced PV concepts"
- Yoshitaka Okada, University of Tokyo, Japan, "Approaches to high-efficiency intermediate band photovoltaics"
- Federico Rosei, INRS, Canada, "Multiferroic solar technologies"
- Aron Walsh, Imperial College London, UK, "Cooperative Polarisation in Perovskite Solar Cells"
- Mingmin Yang, University of Warwick, UK, "Inversion Symmetry Breaking induced Photoelectric Effect"
- Mingjian Yuan, Nankai University, China, "Reduced-dimensional Perovskite for Efficient Optoelectronics"

List of scientific committee members

Jean-François Guillemoles, IPVF, France
Mohamed Amara, INL, France
Stéphane Collin, C2N, France
Edgardo Saucedo, IREC, Spain
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