

**Progress in *Advanced Materials and Nanotechnology* for
Photovoltaics: from Laboratory to the Market.**

***A central pillar for the European PV innovation strategy
The EU PV Clusters 3rd Workshop and General
Assembly***

25th - 26th May 2016

Organised by LEITAT

**Hosted by the University of Barcelona – Faculty of Physics – Av. Diagonal 647
Barcelona – Spain**

DRAFT PROGRAMME

Last updated 02/05/2016



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With the support of:



The 2016 edition of the *EU PV Clusters Workshop and General Assembly* intends to build on the success of the two first Workshops (October 2010 and November 2013) to:

1. Highlight key results of the research and innovation (R&I) projects supported by various programmes of FP7 and Horizon 2020 (the current EU Framework Programme for Research and Innovation 2017-2020) in the field of Photovoltaics (PV) and review their technology readiness level (TRL) in a value-chain approach.
2. Give an updated overview of the portfolio of projects in the PV field to bring forward the global picture of PV R&I in Europe and highlight the impact of advanced materials and nanotechnology on the European PV industry.
3. Identify common R&I priorities for bridging the gap between advanced materials and nanotechnology-based innovation and the successful commercialisation of innovative products and industrial technologies.
4. Provide a forum for discussion, problem solving and planning of R&I activities in Europe and give key recommendations on future R&I needs in the PV domain, including cross-cutting topics (engineering and upscaling, characterisation, modelling, standardisation, safety and pilot lines for PV)
5. Enable the materials, nanotechnology & PV communities in Europe to develop strategic collaborations and industrial partnerships.
6. Review the existing materials, nanotechnology and PV roadmaps to support the development of European PV industry, and to implement them in Horizon 2020.

	Day 1 25 th May (Wednesday)		Day 2 26 th May (Thursday)		Day 3 27 th May (Friday)
Hours		Hours	Sala de Eduard Fontseré	Hours	Sala Enric Cassasas
8:30		8:30	Arrival & Registration	8:30	Registration
8:45		8:45		8:45	
9:00		9:00	Cluster 3,1	9:00	Industrialisation Workshop
9:15		9:15		9:15	MatHero
9:30		9:30		9:30	
9:45	Sala Enric Cassasas	9:45		9:45	
10:00	Arrival & Registration	10:00	Cluster 3,2	10:00	
10:15		10:15		10:15	
10:30	Official Opening	10:30		10:30	
10:45	Workshop objectives: Member of EUPV platform	10:45	Coffee Break	10:45	
11:00	Member of EMIRI platform	11:00		11:00	
11:15	Coffee Break	11:15	Cluster 3,2	11:15	Cooffe Break
11:30		11:30		11:30	
11:45	Cluster 4	11:45		11:45	
12:00		12:00		12:00	
12:15		12:15	Cluster 5	12:15	
12:30		12:30		12:30	
12:45		12:45		12:45	
13:00	Lunch	13:00	Lunch	13:00	
13:15		13:15		13:15	
13:30		13:30		13:30	Lunch + poster session
13:45		13:45		13:45	
14:00		14:00	Cluster 5	14:00	
14:15		14:15		14:15	
14:30	Cluster 2	14:30		14:30	
14:45		14:45	Closing EUPV Cluster Gerenal Assembly	14:45	
15:00		15:00		15:00	Discussion & conclusions
15:15		15:15		15:15	Closing session
15:30		15:30		15:30	
15:45	Coffee Break	15:45	Standadization Workshop	15:45	
16:00		16:00	MatHero	16:00	
16:15		16:15		16:15	
16:30	Cluster 1	16:30	Coffee Break + poster session	16:30	
16:45		16:45		16:45	
17:00		17:00		17:00	
17:15	Cluster 6	17:15		17:15	
17:30		17:30		17:30	
17:45	Cluster 7	17:45		17:45	
18:00		18:00		18:00	
18:15		18:15		18:15	
18:30		18:30		18:30	
18:45		18:45	Discussion & conclusions	18:45	
19:00		19:00		19:00	
19:15		19:15		19:15	
19:30		19:30		19:30	
19:45		19:45		19:45	
20:00	Gala Dinner	20:00		20:00	

Wednesday 25th May 2016

10.00 - 10.30: Arrival and Registration in Enric Cassasas Room

Enric Cassasas Room

10:30 - 11:15: Introduction

Chairman:

10:30 - 10:45: Welcome

10:45 - 11:00: Workshop objectives

11:00 - 11:15: EMIRI Platform

11:15 - 11:45: Coffee break

11.45 - 12.45: Cluster 4 - Concentrator & Tracking

Chairman: **Alejandro Pérez-RODRÍGUEZ**, FUNDACIO INSTITUT DE RECERCA EN ENERGIA DE CATALUNYA (IREC), Spain.

11.45 - 12.00: **Concentrating Photovoltaic modules using advanced technologies and cells for highest efficiencies**

CPV Match (H2020-LCE) Coord: FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. Germany – Speaker: **Romain CARIOU**

12.00 - 12.15: **Towards a 50% efficient concentrator solar cell and a 40% efficient space solar cell**

PVFIFTY (H2020-MSCA) Coord: IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE. United Kingdom – Speaker: **Alexander MELLOR**.

12.15 - 12.30: **An innovative Ceramic Heatspreader within HCPV (High Concentration Photovoltaic) Technology**

COGEM CPV (H2020-SMEINST) Coord: SOLERGY ITALIA SRL. Italy – Speaker: **Vincenzo DIODATO**.

12.30 - 12.45: Questions and discussion

12.45 - 14.15: Lunch break

14:15 - 16:00: Cluster 2 - Thin film PV cells

Chairman: **Friedrich KESSLER**, ZENTRUM FUR SONNENENERGIE- UND WASSERSTOFF-FORSCHUNG BADEN-WURTTENBERG (ZSW), Germany.

14.15 - 14.30: Super high efficiency Cu(In,Ga)Se₂ thin-film solar cells approaching 25%

Sharc25 (H2020-LCE02) Coord: ZENTRUM FUR SONNENENERGIE- UND WASSERSTOFF-FORSCHUNG BADEN-WURTTEMBERG ZSW. Germany – Speaker: **Wolfram WITTE**.

14.30 - 14.45: Development of high-quality crystalline silicon layers on glass

cSiOnGlass (H2020-MSCA) Coord: LEIBNIZ-INSTITUT FUER PHOTONISCHE TECHNOLOGIEN E.V. IPTH. Germany – Speaker: **Michael VETTER**.

14.45 - 15.00: Development of thin film Solar cells based on Wide band Gap kesterite absorbers

SWInG (H2020-LCE02) Coord: INTERUNIVERSITAIR MICRO-ELECTRONICACENTRUM IMEC VZW. Belgium – Speaker: **Thomas SCHNABEL**. (Zentrum fur sonnenenergie- und wasserstoff-forschung baden-wuerttemberg ZSW, Germany)

15.00 - 15.15: Advanced Grating for Thin Films Solar Cell

AGATHA (FP7-ENERGY) Coord: COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES CEA. France - Speaker: To be confirmed

15.15 - 15.30: Training for sustainable low cost PV technologies: development of kesterite based efficient solar cells

KESTCELLS (FP7-PEOPOLE) Coord: FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA IREC. Spain - Speaker: **Edgardo SAUCEDO**.

15.30 - 15.45: Steel PV

STEEL PV (RFSC-TG05) Coord: FUNDACIÓN ITMA MATERIALS TECHNOLOGY. Spain – Speaker: **David GOMEZ**

15.45 - 16.00: Questions and discussion

16.00- 16.30: Coffee break

16.30-17.30: Cluster 1 - Wafer-based PV cells

Chairman: Alexander ULYASHIN, STIFTEKSEN FOR INDUSTRIELL OG TEKNISK FORSKNING (SINTEF), Norway.

16.30 - 16.45: High efficiency rear contact solar cells and ultra powerful modules

HERCULES (FP7-ENV) Coord: COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES CEA. France – Speaker: **Delfina MUÑOZ**.

16.45 - 17.00: Implementation of a Circular economy Based on Recycled, reused and recovered Indium, Silicon and Silver materials for photovoltaic and other applications

CABRISS (H2020-WASTE) Coord: COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES CEA. France – Speaker: **Luc FEDERZONI**.

17.00 - 17.15: High efficiency GaInP/GaAs Tandem wafer bonded solar cell on silicon

HISTORIC (H2020-MSCA) Coord: FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. Germany – Speaker: **Romain CARIOU**.

17.15 - 17.30: Questions and discussion

17.30 - 18.00: Cluster 6 - Production equipments & processes

Chairman: Verónica BERMUDEZ, EDF, France.

17.30 - 17.45: Process Line Implementation for Applied Surface Nanotechnologies

PLIANT (FP7-NMP) Coord: FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. Germany – Speaker: **Arnaud WALTER**. (CSEM Centre Suisse d'electronique et de microtechnique SA - Recherche et developpement, Switzerland)

17.45 – 18.45: Cluster 7 - Industry support

Chairman: Verónica BERMUDEZ, EDF, France.

17.45 - 18.00: Improve the Financeability and Attractiveness of Sustainable Energy Investments in Photovoltaics

SolarBankability (H2020-EE) Coord: The European Academy of Bozen/Bolzano EURAC. Italy – Speaker: **David MOSER**.

18.00- 18.15: Euro-mediterranean cooperation on research & training in sun based renewable energies

EUROSUNMED (FP7-Energy) Coord: CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE. France – Speaker: **Alexander ULYASHIN**. (Stiftelsen for industriell og teknisk forskning SINTEF, Norway)

18.15 - 18.30: ERA-NET on Solar Electricity for the Implementation of the Solar Europe Industry Initiative

SOLAR-ERA.NET (FP7-ERANET) Coord: NET NOWAK ENERGIE & TECHNOLOGIE AG. Switzerland – Speaker: **Severino FALCON**. (Ministerio de Economía y Competitividad, Spain)

18.30 - 18.45: Questions and discussions (Cluster 6&7)

20.00: Gala Dinner at Mussol (av. Diagonal 488) hosted by LEITAT

Thursday 26th May

8.30-9.00 am: Arrival and Registration

Eduard Fontseré Room

9.00 - 9.45: Cluster 3 - Third generation PV cells Subcluster 3.1 - Nanostructures

Chairman: Joan Ramón MORANTE, FUNDACIO INSTITUT DE RECERCA EN ENERGIA DE CATALUNYA (IREC), Spain.

9.00 - 9.15: Nanowire based Tandem Solar Cells

NanoTandem (H2020-LCE01) Coord: LUNDS UNIVERSITET. Sweden – Speaker: **Magnus BORGSTRÖM**

9.15 - 9.30: Production technology to achieve low Cost and Highly Efficient photovoltaic Perovskite Solar cells

CHEOPS (H2020-LCE02) Coord: CSEM CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DEVELOPPEMENT. Switzerland – Speaker: **Arnoud WALTER**.

9.30 - 9.45: Questions and discussions (Cluster 3, subclusters 3.1)

9:45 - 10:45: Cluster 3 - Third generation PV cells, Subcluster 3.2 - Organic PV cells or dye-sensitized PV cells

Chairman: David GUTIERREZ, LEITAT TECHNOLOGICAL CENTER, Spain. / **Stephane CROS**, COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (CEA), France.

9.45 - 10.00: Development of smart machines, tools and processes for the precision synthesis of nanomaterials with tailored properties for Organic Electronics

Smartonics (FP7-NMP) Coord: ARISTOTELIO PANEPISTIMIO THESSALONIKIS. Greece – Speaker: Argiris **LASKARAKIS**.

10.00 – 10.15: Advanced laser ablation barrier films for organic and large area electronic devices

ALABO (H2020-ICT03) Coord: FRAUNHOFER-INSTITUT FÜR WERKSTOFF-UND STRAHLTECHNIK IWS. Germany - Speaker: **Udo KLOTZBACH**.

10.15 - 10.30: Efficient, large-area arbitrary shape solar energy

ARTESUN (FP7-NMP) Coord: TEKNOLOGIAN TUTKIMUSKESKUS VTT. Finland – Speaker: **Birger ZIMMERMANN**. (Fraunhofer-gesellschaft zur foerderung der angewandten forschung E.V., Germany)

10.30 - 10.45: Innovative Materials for Multiple Junction OPVs and for Improved Light Management

MUJULIMA (FP7-NMP) Coord: NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK – TNO. Netherlands - Speaker: **Muriel MATHERON**. (Commissariat a l energie atomique et aux energies alternatives CEA, France)

10:45-11:15 pm: Coffee break

11.15 – 12:30: Cluster 3 - Third generation PV cells, Subcluster 3.2 - Organic PV cells or dye-sensitized PV cells (Continuation)

Chairman: David GUTIERREZ, LEITAT TECHNOLOGICAL CENTER, Spain. / **Stephane CROS**, COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (CEA), France.

11.15 – 11:30: New materials for highly efficient and reliable organic solar cells
MATHERO (FP7-NMP) Coord: KARLSRUHER INSTITUT FUER TECHNOLOGIE. Germany – Speaker: **Alexander COLSMAN**.

11.30 – 11:45: Solution processed high performance transparent organic photovoltaic cells
SOLPROCEL (FP7-NMP) Coord: FUNDACIO INSTITUT DE CIENCIES FOTONIQUES ICFO. Spain – Speaker: **Jordi MARTORELL**.

11.45 - 12.00: SUsustainable Novel FLexible Organic Watts Efficiently Reliable
SUNFLOWER (FP7-ICT) Coord: CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA (CSEM) - RECHERCHE ET DEVELOPPEMENT, Switzerland – Speaker: **Giovanni NISATO**

12.00 - 12.15: New neutron techniques to probe bulk heterojunction solar cells with graded morphologies – understanding the link between processing, nanostructure and device performance
NeutronOPV (H2020-MSCA) Coord: THE UNIVERSITY OF SHEFFIELD. United Kingdom – Speaker: **Gabriel BERNARDO**.

12.15 – 12.30: Questions and discussion

12.30 – 13.00: Cluster 5 - Innovative installations

Chairman: Verónica BERMUDEZ, EDF, France.

12.30 – 12.45: Energy Efficient Ventilated Facades for Optimal Adaptability and Heat Exchange enabling novel NZEB architectural concepts for the refurbishment of existing buildings
E2VENT (H2020-EeB) Coord: NOBATEK. France – Speaker: **Pau CASALDALIGA**. (Picharquitects, Spain)

12.45 – 13.00: Development and demonstration of flexible multifunctional ETFE module for architectural façade lighting
ETFE-MFM (FP7-ENERGY) Coord: FUNDACIÓN ITMA MATERIALS TECHNOLOGY. Spain – Speaker: **Armando MENENDEZ**

13.00 - 14.15: Lunch break

14.15 – 15:00: Cluster 5 - Innovative installations (Continuation)

Chairman: Verónica BERMUDEZ, EDF, France.

14.15 – 14.30: Building-integrated photovoltaic technologies and systems for large-scale market deployment

PVSITES (H2020-LCE03) Coord: FUNDACION TECNALIA RESEARCH & INNOVATION. Spain – Speaker: **Maidor MACHADO.**

14.30 - 14.45: Building-integrated fibre-reinforced solar technology

BFIRST (FP7-ENERGY) Coord : FUNDACION TECNALIA RESEARCH & INNOVATION. Spain – Speaker: **Maidor MACHADO.**

14.45 - 15.00: Questions and discussion

15.00 – 15.30: Closing EUPV Cluster General Assembly

Followed by:

16.00 - 19.15: MatHero Workshop: OPV Standardisation (Eduard Fontseré Room)

Friday 27th May 2016

9.00 - 16:00: MatHero Workshop: OPV Industrialisation (Enric Casasas Room)