

# Organic and Large Area Electronics Newsletter



Organic and Large Area Electronics Newsletter, Issue No 3, February 2009

*Organic and large area electronics is one of the most promising fields of electronic technologies. R&D activities in this area have led to the demonstration of the main basic electro-optic functionalities. Similarly, the first commercial applications have already been announced by several EU companies. The future of this new class of technologies is expected to open up the possibilities for new products that will not compete with the existing silicon technology, but instead create a new market that could reach the size of silicon within two decades.*

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Dear reader,

**The call for proposals on the R&D objective ICT-2009-3.3 "Flexible, organic and large area electronics" is now open until 1 April 2009. A new pre-proposal service is now available to proposers in this R&D objective. Further information on these issues can be found in this newsletter.**



**In addition, you will find information on our projects (PolyNet, OPERA), on upcoming events, on recent conferences and on our cluster and stakeholders' meetings.**

**I hope you will enjoy reading this Newsletter.**

**Dr. Augusto de Albuquerque**

## OPERA Vision Paper on Organic and Large Area Electronics

The overall objective of the Coordination Action **OPERA** is to strengthen the position of Europe as a leading force in organic electronics. More specifically, the **OPERA** project aims to create the conditions for the establishment of a number of competitiveness clusters in Europe. To address these issues, OPERA is working on these action lines:

- the development of a strategic framework maximising synergy and cooperation in the sector,
- the acceleration of technological progress and the development of commercial organic electronic applications,
- the creation of channels of exchange of ideas and people,

- the development of tools for stimulating entrepreneurship,
- the acceleration of the development of industry standards and enhancing the visibility of the field.

### OPERA Vision Paper on Organic and Large Area Electronics

In this context, the **OPERA** project has set up a task force which has drafted a vision paper briefly outlining the opportunities and challenges in flexible, organic



and large area electronics and making a set of recommendations on how to further strengthen the European position in this field.

The first draft of this vision paper was presented at the Organic and Large Area Electronics Stakeholders' Meeting, held in Brussels on 18 November 2008, by the task force coordinator Karl Leo. Other task force members are Harri Kopola, Richard Friend, Thomas Geelhaar, Jaap Lombers and Ed van den Kieboom.

For further details on this initiative and on other activities carried out by the OPERA project, please consult the OPERA project website: <http://opera-project.eu> or the quadriga website <http://quadriga-org.eu>

## Organic and Large Area Electronics Newsletter

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# Events on organic and large area electronics

## □ 3<sup>rd</sup> Organic and Large Area Electronics Stakeholders' Meeting

*The goal of the **Organic and Large Area Electronics Stakeholders' Meetings** is to identify issues and propose recommendations that can promote the growth and competitiveness of the European industry in Organic and Large Area Electronics.*

The consolidation of the European leading role in the area of organic and large area electronics would benefit from the identification of key challenges in the field, as well as the formulation of recommendations to contribute to its development. With a view to achieving these objectives, the [First Organic and Large Area Electronics Stakeholders' Meeting](#) was organised in May 2007, followed by the [Second Organic and Large Area Electronics Stakeholders' Meeting](#) in October 2007.



In the **First Organic and Large Area Electronics Stakeholders' Meeting**, three working groups were created to work on the three critical challenges identified in this domain:

- **Working group 1**, focussed on strengthening the cooperation among players, IPR issues on innovation, etc
- **Working group 2**, concentrated on market issues (technology roadmaps, users-suppliers clubs, etc)
- **Working group 3**, covering funding initiatives (creation of start-ups, "death valley" overcome, best practices and lessons learned)

### **The Third Organic and Large Area Electronics Stakeholders' Meeting**

The [Third Edition of the Organic and Large Area Electronics Stakeholders' Meeting](#) was held in Brussels on 18 November 2008.

[http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home\\_en.html](http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home_en.html)

More than 70 attendees, coming from both industry and academia, participated in this event opened by the Director INFOSO G Thierry Van der Pyl, who emphasised in his welcome speech the increasing relevance of this promising field –which has been predicted a market that could reach the size of the silicon one within two decades-. In addition, the role that these Stakeholders' Meetings can play in increasing the European innovation and competitiveness in this emerging field was highlighted.

"Europe's leadership in ICT research and innovation in the next decade" and "International Cooperation" in this area were addressed by Michael Arentoft and Jean Yves Roger, respectively. Following these presentations, the chairmen of the three OLAE working groups (Dr. Herman Schoo –WG1-, Dr. Klaus Hecker –WG2- and Dr. Harri Kopola and Mr. Ed van den Kieboom –WG3-) reported on their main activities.

Furthermore, the first results of the EC FP7 funded project [PolyMap](#) were presented, giving a first overview of the situation in terms of national and regional funding in the domain of organic and large area electronics in Europe. Moreover, the [OPERA](#) project, which has set up a task force, released their vision paper for the area, which outlines the opportunities for Europe in this domain as well as makes recommendations on how to further strengthen Europe's position.



The [PolyNet](#) project, a EC FP7 funded NoE, presented an overview of their research activities, which are implemented through the setup of research cooperation platforms aiming at overcoming R&D fragmentation in Europe.



Additionally, the activities of the [European Observatory on Organic Electronics \(EOOE\)](#), carried out within the [PolyNet](#) project, were introduced by Dr. Guilles Horowitz. Education and training activities in organic and large area electronics are also covered, by the Knowledge Platform within [PolyNet](#) and the CSA [PRODI](#).

### **Conclusions**

The industry in the field of organic and large area electronics is still quite fragmented in several areas, with the research efforts being dispersed into several objectives covered by various national research programmes: chemistry, materials, Microsystems, photonics, energy, photovoltaics, etc.

*One major outcome of this Stakeholders' Meeting was the need for coordination among the national and regional funding agencies supporting the development of this domain.*

Coordinated funding initiatives would help to avoid fragmentation and duplication of efforts at European level and to create a European critical mass. Furthermore, the interest of the Member States in the creation of a European Research Area Network (ERA-NET) should be analysed.

*Additionally, it was considered to be particularly relevant for the OLAE community to further structure this domain with a view to define a Strategic Research Agenda (SRA), which would describe R&D priorities in this domain for the next 5-15 years. An active participation of industry in this initiative was also found to be crucial.*

For further details on this event please consult the website: [http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/events-20081118\\_en.htm](http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/events-20081118_en.htm)

# News on organic and large area electronics

## Flexible, Organic and Large Area Electronics in the ICT Work Programme 2009 - 2010

At present, the new challenges and objectives for ICT research funding within FP7 are set out by the ICT Work programme 2009-2010, which has recently been unveiled. In the ICT Work programme 2009-2010, **Organic and Large Area Electronics** continues to be a priority area, which will be covered by the two R&D objectives **“Flexible, organic and large area electronics”** and **“Organic photonics and other disruptive photonics technologies”**.

The objective ICT-2009-3.3 **“Flexible, organic and large area electronics”**, which has a dedicated budget of 60 M€, covers R&D activities ranging from the development of devices and functional blocks to their integration into systems.

Emphasis is on device demonstrators such as power converters, batteries, memories, sensors, active RFIDs, D&A circuits and CMOS; and systems applications such as e-paper, e-cards, energy storage, OLED/PV based systems, chemical/physical/bio sensors, signal processing, radio transmission & receive and signage.

The funding schemes to be used to address these R&D target outcomes are Integrated Projects (IPs) and Specific Research Targeted Projects (STREPs). The budget available is 54.5 M€, with an indicative distribution of a minimum of 50% to IPs and a minimum of 30% to STREPs.

In addition, this call will fund other initiatives aiming at coordinating R&D in this domain, which

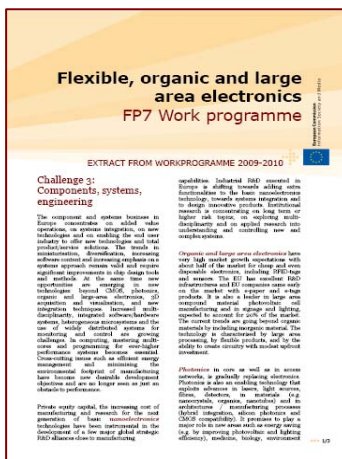


should be implemented through the specific funding scheme Network of Excellence (NoE).

The proposals should aim at structuring and integrating the research capabilities in the area, providing links between R&D organisations and the industrial needs, coordinating R&D and providing training and education in the area. The maximum budget available is 4 M€.

[http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home\\_en.html](http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home_en.html)

Furthermore, the objective on **“Flexible, organic and large area electronics”** will cover non-R&D activities aiming at structuring and consolidating this field. Support measures are expected to stimulate international cooperation, coordinate regional, national and EU R&D programmes, provide access to prototyping and design competences, and cover training and education activities for SMEs. The funding schemes to be used for proposals addressing these areas are CSAs, and the funding available for these measures is 1.5 M€.



The field of organic and large area electronics is also partially covered by the objective ICT-2009.3.8 **“Organic photonics and other disruptive photonics technologies”**. This R&D objective, which has a total budget of 30 M€, addresses research activities in organic photonics but also in other photonics technologies such as nanophotonics.

**The call for proposals in these objectives opened on 19 November 2008 and will close on 1 April 2009. The complete call text can be found in the [ICT Work programme 2009-2010](#).**

### OLAE in ICT Call 4

Publication date: 19.11.2008

Closure date: 1.04.2009

R&D objectives and budget: “Flexible, organic and large area electronics” (60 M€) and “Organic photonics and other disruptive photonics technologies” (30 M€)

### PRE-PROPOSAL SERVICE

A pre-proposal service will be available for the first time to proposers submitting their proposals in the R&D objective ICT-2009-3.3 **“Flexible, organic and large area electronics”**.

To take advantage of this service the proposers should complete the pre-proposal form which is available for download on the Organic and Large Area Electronics Website on CORDIS (<http://cordis.europa.eu/fp7/ict/organic-elec-visual-display>) and send it to the email address: [INFSO-FOLAE-ELECTRONICS@ec.europa.eu](mailto:INFSO-FOLAE-ELECTRONICS@ec.europa.eu). This form may be submitted at any time until three weeks before the close of this call on 1 April 2009 at 5:00 pm.



The Commission services will reply by fax or electronic mail giving a brief assessment of this pre-proposal. The assessment does not constitute in any respect a pre-evaluation of the proposal in terms of scientific and technical quality. The advice given by the Commission is strictly informal and non-binding. The advice provided through this pre-proposal check does not in any way engage the Commission with regard to acceptance or rejection of the proposal when it is formally submitted. For further details please consult our site on CORDIS: <http://cordis.europa.eu/fp7/ict/organic-elec-visual-display>

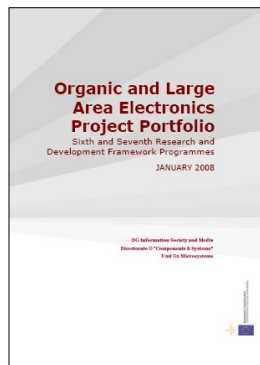
# Events on organic and large area electronics

## □ Organic and Large Area Electronics Cluster Meeting 2009

The **Organic and Large Area Electronics Cluster Meeting 2009** was held at EC premises in Brussels on 13-14 January 2009. This event, which brought together all active EC-funded projects in this field, aimed to:

- Encourage the exchange of information and best practices among projects
- Identify synergies and relevant topics for further cooperation
- Improve the performance of individual projects
- Build a critical mass of activities in the field of Flexible, Organic and Large Area Electronics

More than 70 attendees representing 23 different projects participated in this concertation meeting, which was opened by Augusto de Albuquerque, who analysed the evolution experienced in this area during both FP6 and FP7, the current situation and the challenges for Europe in the coming years.



The [Organic and Large Area Electronics Project Portfolio](#) collects the EC-funded projects in this domain in FP6 and the first ICT Call in FP7

The first day of the **Organic and Large Area Electronics Cluster Meeting 2009** was structured in four sessions:

- “Lighting and displays”, chaired by Henri Rajbenbach;
- “Flexible and large area electronics”, chaired by Marc Boukerche;
- “Energy cost-efficient photovoltaics”, chaired by Pedro Pires;
- “OLAE scenario: the projects structuring the area”, chaired by Thomas Reibe.

[http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home\\_en.html](http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home_en.html)

The projects’ contributions were focused on presenting the objectives of the projects; their major technological challenges and solutions; and their results, exploitation potential, and benefits.

Special attention was given to topics which may benefit from cooperation within this cluster. To this end, three fruitful roundtable discussions on the key areas were held. Mary Kilitziraki chaired the one on “Encapsulation, Passivation, Barriers, Measurement”; Jose Magarino

chaired the one on “Contacts and interfaces”; and Wilfried Loevenich chaired the one on “Transparent Conductors”.

Finally, the **Organic and Large Area Electronics Cluster Meeting 2009** concluded with presentations of the R&D ICT objectives in this domain - “**Flexible, organic and large area electronics**” by Thomas Reibe; and “**Organic Photonics and other disruptive photonics technologies**” by Michael Hohenbichler.



The European Commission’s Information Society and Media Directorate-General, in cooperation with the Hungarian National Office for Research and Technology organised the [FP7 ICT Proposers’ Day 2009](#).

This event, which took place in Budapest on 22 January 2009, was a unique opportunity for the attendees to familiarise themselves with the research challenges and objectives of the ICT Work programme 2009-2010 and to form project consortia for participating in calls for proposals. In addition, the EC staff present at the event provided advice on the specifics of the ICT WPO9-10 and on the general rules and procedures for participating in FP7.



This [ICT Proposers’ Day 2009](#), which was attended by more than 1600 registered participants, was organised in parallel sessions which covered, among other R&D objectives, the areas of “**Flexible, organic and large area electronics**”, “**Microsystems and smart miniaturised systems**”, and “**Organic Photonics and other disruptive photonics technologies**”.



The R&D objective on “**Flexible, organic and large area electronics**” was represented by the EC scientific officers Marc Boukerche and Raquel López-Lozano, who were available on 22 January at the information booth of this objective to provide details on the contents of this research objective as well as clarify and discuss administrative and technical issues concerning participation in FP7.

In addition, a detailed presentation of this R&D objective, including target outcomes, expected impact, and use of instruments and call planning, was given in a specific parallel session, which was attended by more than 30 participants. This session concluded with a presentation of potential proposals in this R&D objective and Q&A.

For further details on this session, please visit the session site: [http://ec.europa.eu/information\\_society/events/cf/item-display.cfm?id=917](http://ec.europa.eu/information_society/events/cf/item-display.cfm?id=917) or the event website: [http://ec.europa.eu/information\\_society/events/budapest\\_2009](http://ec.europa.eu/information_society/events/budapest_2009)

# New projects in organic and large area electronics

## □ PolyNet, the Network of Excellence for the exploitation of organic and large area electronics

*PolyNet is a Network of Excellence (NoE) with 17 partners from 10 countries. The activities within PolyNet are divided into three main platforms: the Knowledge platform, the Service platform and the Research cooperation platform. A significant part of the budget is devoted to research collaborations within the latter platform, as these activities are crucial to build up the NoE.*

### The Research Cooperation Platform

The main task of the research cooperation platform is to perform collaborative research work in cooperation clusters, consisting of 4 to 7 PolyNet partners. Important objectives of this task are to focus on such issues and problems that demand the collected effort of several partners to be resolved and are commonly viewed to be important for the development of the field, and to promote present and future collaboration by regular exchange of staff.

Six research collaborations have been in operation during 2008 and have recently reported their activities and results. In the following, we will present an overview of these research activities for each collaboration. Further information and contact details are available at [www.vdivde-it.de/polynet](http://www.vdivde-it.de/polynet).

### Collaboration 1 – Laser ablation

The laser ablation collaboration has set as a goal to integrate laser-ablative microstructuring into R2R printing technology.

During 2008 it has been shown that functional conductive PEDOT:PSS patterns can be R2R produced by gravure printing followed by laser ablation. A test pattern with an inset showing the measured depth profile of one laser ablated line is shown in Figure 1.

### Collaboration 2 – Thin film batteries

The second collaboration aims to analyse production methods for thin film batteries to be able to propose efficient

production methods. Anode and cathode inks for printed lithium-based batteries have been formulated and used in successful printing trials, showing promise for screen and gravure printed batteries.

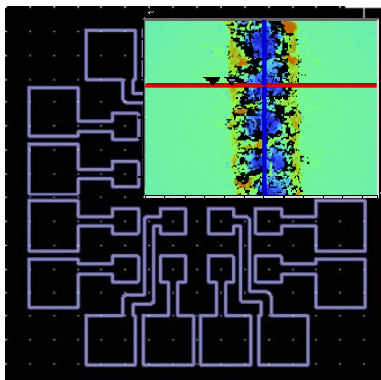


Figure 1. Laser ablation: Test pattern with inset showing depth profile of laser ablated line.

### Collaboration 3 – Nanoimprint lithography

A technology platform consisting of six PolyNet partners has been set up to demonstrate the feasibility of R2R nanoimprinting for the fabrication of sub- $\mu\text{m}$  OTFTs.

During 2008, the material system has been defined and the feasibility of the process demonstrated from the front-end to the core process. We believe this is the first technology platform for such high resolution processing in Organic Electronics in Europe.

### Collaboration 4 – Multifunctional materials

In the fourth collaboration, the focus is on materials with the potential to limit the number of steps in fabrication of organic opto-electronic devices. Several new n- and p-type organic semiconductors have been synthesized and oriented semiconductor films have been deposited.

Chemical, structural and electrical characterisation of materials and OTFTs has been performed.

### Collaboration 5 – Device modelling

The modelling collaboration has the goal to find physical analytical device models that can be inserted into commercial software to predict circuit performance. Focus is on OTFTs and Schottky diodes, and on predicting gate voltage stability. Recently, characterisation of PTAA components has been performed and work has been initiated on TIPS-based components.

### Collaboration 6 – Component integration

The last collaboration has gathered four partners to show that different classes of organic components can be merged into a functional system.

A demonstrator (Figure 2) based upon an OTFT transistor and a screen printed electrochromic display, connected via an anisotropic conductive adhesive, has been built and successfully shown to work.

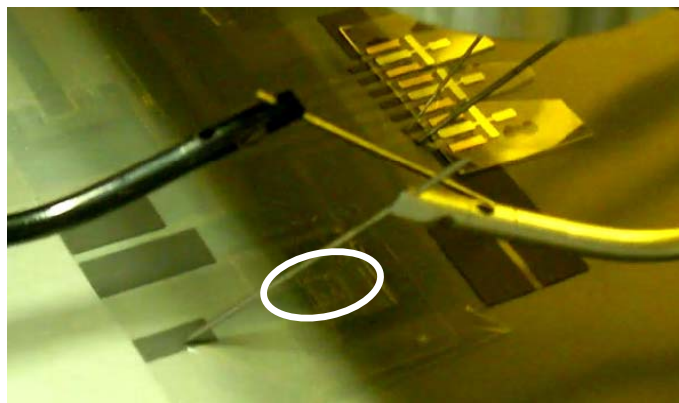


Figure 2. Component integration: Demonstrator system with OTFT (upper right) and EC display (circled)

For further information, please contact: Isak Engquist ([Isak.Engquist@itn.liu.se](mailto:Isak.Engquist@itn.liu.se)).

### PolyNet

Website: <http://www.vdivde-it.de/polynet>

Contact person: Lars Heinze

E-mail: [Heinze@vdivde-it.de](mailto:Heinze@vdivde-it.de)

Timeline: 1.01. 2008 – 31.12.2010

[http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home\\_en.html](http://cordis.europa.eu/fp7/ict/organic-elec-visual-display/home_en.html)

# Event calendar

*In this section a non-exhaustive list of events and conferences, which are in most cases related to EU-funded projects in the field of Organic and Large Area Electronics, is compiled.*

29-30 APRIL 2009, Brno (CZ)

**FP7 Brno Information Day.** At this Information Event a general presentation of the ICT Work Programme 2009-2010 will be made and, specifically, the R&D objectives to be called for in Calls 5&6 will be covered in detail.

23-25 JUNE 2009, Frankfurt (DE)

**Large area, organic and printed electronics convention (LOPE-C).** At this convention the latest developments in the innovative and dynamic field of organic and printed electronics will be shown.



The topics covered include materials, devices, processes, equipment, production, applications, end-users and services, with an emphasis on applications and products (e.g. printed memory devices for games

and consumer goods, printed RFID for brand protection and logistics, flexible batteries to power mobile devices, rollable displays, organic sensors and organic photovoltaic cells).

**Website:** <http://www.lope-c.com>

8-10 JULY 2009, Halkidiki (EL)

**2<sup>nd</sup> International Symposium on Flexible Organic Electronics (ISFOE 2009).** The purpose of this symposium is to bring together scientists and engineers actively engaged in the research, development and manufacturing of flexible organic electronics.

The topics of the IS-FOE symposium 2009 will include, but are not limited to: organic semiconductor materials (small molecules and polymers), organic/inorganic and hybrid materials and systems, transparent/non-transparent electrodes, flexible substrates and encapsulation methods & materials, molecular electronics and photonics, self organised molecules and systems, theory



## High Level Event on ICT for Energy Efficiency (ICT4EE)

**The High Level Event on ICT for Energy Efficiency (ICT4EE)** aims to accord visibility to the potential of ICTs in enabling energy efficiency across the economy and, in particular, it will show how ICT-based innovations may provide one of the potentially most cost-effective means to achieve the 2020 energy and climate targets.



**The European Commission** is aiming to create a lasting policy framework on ICT for Energy Efficiency. To this end, the European Commission's Information Society and Media Directorate-General, in cooperation with the Czech Presidency of the European Union, is hosting the **High Level event on ICT for Energy Efficiency (ICT4EE)** in Brussels on 19-20 March 2009.

### iii) saving 20% of the EU's energy consumption

They aim at significant environmental benefits, while providing a unique business opportunity for thousands of European companies. Their implementation depends on Europe's capacity to innovate.

### ICT enabling Energy Efficiency

**The European Union 2020 targets** are:

- i) reducing carbon emissions by 20%,**
- ii) Increasing the share of renewables in energy consumption to 20%, and**

[http://ec.europa.eu/information\\_society/events/ict4ee/2009](http://ec.europa.eu/information_society/events/ict4ee/2009)

**The High Level Event on ICT for Energy Efficiency (ICT4EE)** will be a two-day conference, which will combine both plenary and parallel sessions. The conference will be complemented by an exhibition of stands illustrating results achieved by relevant EU-funded projects and a set of booths for international initiatives in this area including the ETPs.

& modelling (materials, components and devices), manufacturing processes (printing, vacuum, chemical), flexible displays & lighting, flexible solar cells, flexible circuits and sensors and flexible batteries, etc.

**Website:** <http://isfoe.physics.auth.gr>



27-29 OCTOBER 2009, Dresden (DE)

**5th Plastic Electronics Conference and Showcase.** The Plastic Electronics Conference & Showcase 2009, which will take place in Dresden, is a three-day international event which will cover major developments and assess the key issues applicable to all areas of flexible, organic and large area electronics.

**Website:**

<http://www.plastic-electronics.org/global/index.php>

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