

PRESS RELEASE

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Functional organic molecules and quantum materials – development, processing, application

The Fraunhofer Institute for Applied Polymer Research IAP will present research results and milestones of ongoing projects in the fields of organic photovoltaics (OPV), inkjet and ESJET printing as well as quantum dot-based LEDs (QLEDs) at Printed Electronics Europe 2018 at booth K12.

Printed OPV elements for architecture and textiles

Within the BMBF research project EPOS (research, development and integration of material-efficient process technologies for future applications of semi-transparent Flex-OPV), flexible, printed OPV elements were developed that have their application in, for example, architecture (façade elements) or textiles (energy harvesting textiles).

The researchers produced the exhibits at the in-house pilot plant. On this plant, the Fraunhofer scientists develop printing processes on a pilot, near industrial scale.

ESJET printing for high-resolution OLEDs

In the EU Hi-Response project (Innovative High Resolution Electro-static Printing of Multifunctional Materials), researchers are working with twelve other European partners on a new printing process for organic electronic devices. Electrostatic jetting (ESJET) allows the use of a wider range of inks for the printing and the deposition of very fine structures. This opens the access to printed high-resolution OLEDs, among other things.

Cadmium-free QLEDs for the display industry

Also in the field of quantum materials the Fraunhofer IAP shows remarkable results. The research on cadmium-free QLEDs based on indium phosphide is groundbreaking for the industry. According to the current RoHS (Restriction of Hazardous Substances) directive, the use of cadmium in the display sector, and therefore also in QLEDs from 2020, is prohibited. However, cadmium-free QLEDs have not yet achieved the performance required for applications compared to Cd-based systems. The results of the Fraunhofer researchers show that InP-based QLEDs are well on their way to achieving the same performance as Cd-based systems and outperforming them in certain aspects (e.g., luminance).

Editorial notes

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Funding

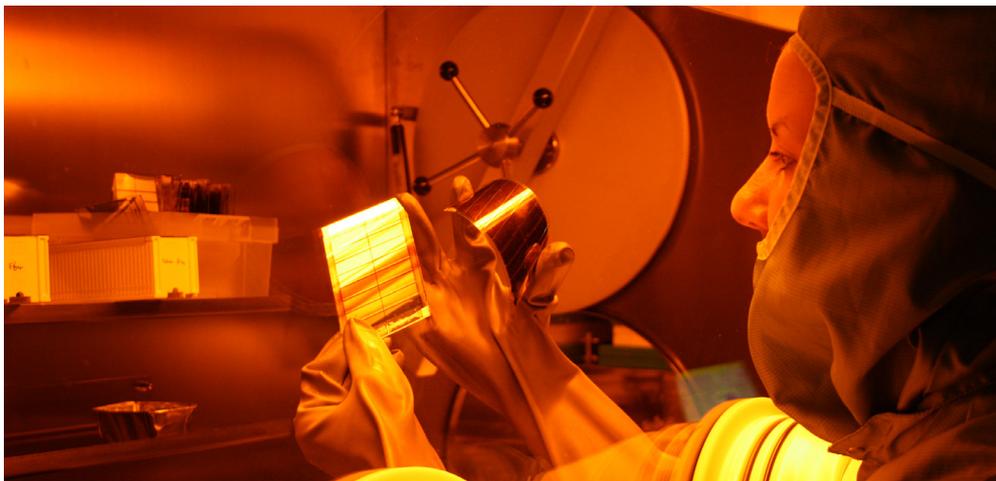
Solar powered LED illuminated bike jacket | This project has received funding from BMBF within the framework of the project EPOS, BMBF FKNZ 03EK2529.

Photovoltaics as a substitute for ITO electrodes | This project has received funding from the European Union's H2020-NMP-PILOTS-2014 programme under grant agreement No. 646296).

ELQ-LED | This project was funded by the BMBF under grant number 13N14421.

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Flexible photovoltaic elements, manufactured on Fraunhofer IAP's own pilot plant.

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The **Fraunhofer Institute for Applied Polymer Research IAP** in Potsdam-Golm, Germany, specializes in research and development of polymer applications. It supports companies and partners in custom development and optimization of innovative and sustainable materials, processing aids and processes. In addition to the environmentally friendly, economical production, functionalization and processing of polymers in the laboratory and pilot plant scale, the institute also offers the characterization of polymers.

Synthetic petroleum-based polymers as well as biopolymers, polymers from renewable raw materials and chemically, physically or biologically functionalized polymers are in the focus of the institute's work. The applications are diverse, ranging from biotechnology, medicine, pharmacy and cosmetics to electronics and optics as well as applications in the packaging, environmental and wastewater engineering or the aerospace, automotive, paper, construction and coatings industries. | Director: Prof. Dr. Alexander Böker

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 72 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of more than 25,000, who work with an annual research budget totaling 2.3 billion euros. Of this sum, almost 2 billion euros is generated through contract research. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.