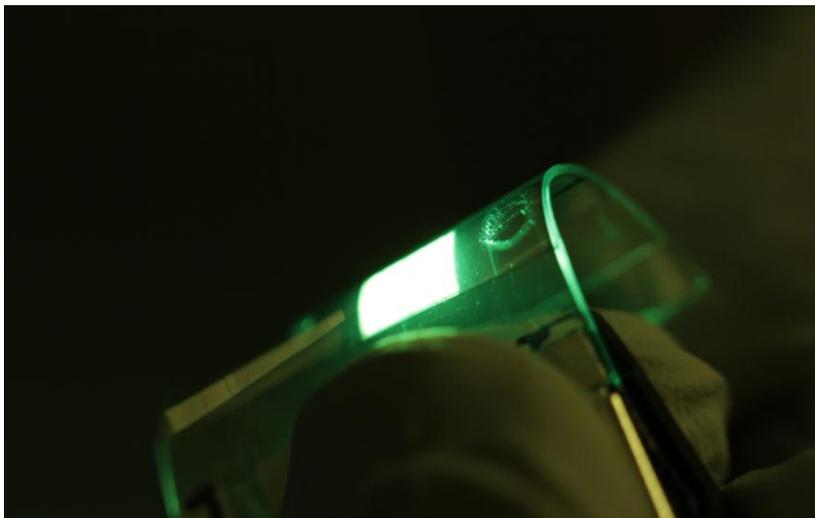


## OLED – Light-emitting Flexible Surfaces

cyFLEX: KIT and cynora Make Organic Light-emitting Diodes Fit for Inexpensive Printing



*OLED emit homogeneous planar light and may be applied to flexible carrier materials.  
(Photo: Ralph Eckstein)*

The “cyFLEX” project is aimed at adapting materials for organic light-emitting diodes (OLED) to printing and coating processes. Printed OLED might be used for future production of luminous packagings, labels, and billboards. cyFLEX is carried out by the Light Technology Institute (LTI) of KIT in cooperation with cynora GmbH and covers the complete chain of values added from the material to the component. The project has just started with a total funding volume of EUR 576,000 and has a duration of two years. The Federal Ministry of Education and Research funds the project with EUR 319,000.

Organic light-emitting diodes consist of organic layers with nanometer thickness. They supply homogeneous, planar light without any shadows. Moreover, OLED are characterized by a high flexibility. They may be applied to flexible carrier materials, e.g. to plastic foils, as a result of which foldable or rollable ultra-thin displays or self-luminous packagings can be produced. Compared to polymer OLED, OLED based on low-molecular compounds, so-called small molecules, are characterized by higher energy efficiencies, better

**Monika Landgraf**  
Chief Press Officer

Kaiserstraße 12  
76131 Karlsruhe, Germany  
Phone: +49 721 608-47414  
Fax: +49 721 608-43658  
E-mail: [presse@kit.edu](mailto:presse@kit.edu)

**For further information,  
please contact:**

Margarete Lehné  
Press Officer  
Phone: +49 721 608-48121  
Fax: +49 721 608-43658  
E-mail:  
[margarete.lehne@kit.edu](mailto:margarete.lehne@kit.edu)

qualities, and longer service lives. However, production of small-molecule OLED has been based nearly exclusively on material-consuming vacuum evaporation of expensive metal complexes so far. "To produce high-quality OLED at competitive costs, low-cost metal-organic molecules have to be developed and adapted to appropriate printing and coating processes," Dr. Norman Mechau, Head of the working group at the Light Technology Institute of KIT, explains.

For this purpose, the cyFLEX joint project was launched: cynora GmbH developed optoelectronic emitter materials based on copper metal that is inexpensive and highly available. Under cyFLEX, these patented materials will be modified specifically. Dissolution, viscosity, wetting, and layer formation properties will be varied such that the materials are converted into liquid formulations and may be applied in the form of homogeneous thin films for use in printing and coating processes suited for mass production.

Under cyFLEX, the consortium of cynora, KIT's LTI, and the InnovationLab (iL) GmbH research and transfer platform adapts copper-based emitter materials to printing and coating processes, develops OLED inks, and studies aspects of liquid processing and large-area printing. It is planned to produce a printed flexible OLED foil in a small series. Potential packagings with luminous and animated images, logos, and texts might open up new product marketing options in the future. "For example, light effects may start when a customer approaches a product in order to attract attention," Dr. Norman Mechau says.

**cynora GmbH** studies novel organic semiconductors that can be used as luminophores in organic light-emitting diodes due to their physical properties. Activities cover complete material and component development, from the design of new functional molecules for organic light-emitting diodes to laboratory synthesis to the testing of materials in the production of OLED components. Work is aimed at further increasing the efficiency of OLED, at improving their service life, and at reducing production costs. cynora GmbH has its office at one of the two KIT high-tech incubators on Campus North. Further information is available at [www.cynora.com](http://www.cynora.com).

**InnovationLab (iL) GmbH** is an application-oriented research and transfer platform of science and industry in the Rhine-Neckar Metropolitan Region. It is funded by the universities of Heidelberg and Mannheim, Karlsruhe Institute of Technology (KIT), and the companies of BASF SE, Merck KGaA, Heidelberger Druckmaschinen AG, and SAP AG.

**Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. Research activities focus on energy, the natural and built environment as well as on society and technology and cover the whole range extending from fundamental aspects to application. With about 9000 employees, including nearly 6000 staff members in the science and education sector, and 24000 students, KIT is one of the biggest research and education institutions in Europe. Work of KIT is based on the knowledge triangle of research, teaching, and innovation.**

This press release is available on the internet at [www.kit.edu](http://www.kit.edu).

The photo of printing quality may be downloaded under [www.kit.edu](http://www.kit.edu) or requested by mail to [presse@kit.edu](mailto:presse@kit.edu) or phone +49 721 608-47414. The photo may be used in the context given above exclusively.