



## FIRST INTERNATIONAL NANOTECHNOLOGY CONFERENCE ON COMMUNICATION AND COOPERATION

### Abstract

#### *(Opto-)Electronic Devices enabled by Organic Materials*

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Organic electronics is a rapidly developing technological area, which will pave the way to many new applications and products. Thin emissive displays, based on the use of electroluminescent semiconductive polymers, have recently become commercially available. Philips has just launched the first commercial products comprising polymer light-emitting diode displays, which indeed are the first polymer electronics products to reach the market.

Organic semiconductors can also be applied to build organic transistors for application in polymer integrated circuits, or as pixel switches and even drivers for displays. Applications have been demonstrated in a research environment, but significant effort is still required to address production issues and to demonstrate business opportunities. The present state of affairs is comparable with that at the beginning of the silicon-based IC industry, some 40 years ago. The application of organics for low-cost electronic products, like labels and barcodes and for electronic paper, will lead to a range of interesting new products, which will form the basis for a revolutionary change of the electronics industry.

New options of organic semiconductors, e.g. as active material in photovoltaic cells (e.g., for organic solar cells) or for solid storage, are just beginning to be explored. Another emerging application area is that of sensors. Polymeric and oligomeric semiconductors can be tailor-made to optimize their responsiveness towards specific targets and may form the basis for new approaches to chemical sensing.

*Options and challenges of semiconductive organic materials will be discussed, with emphasis on their application in light emitting displays, reflective flexible displays and in electronic barcodes.*