

# Towards nanostructured organic field effect transistors by additive unconventional lithographies

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Unconventional nanofabrication is attractive for organic electronics because of its potential impact in manufacturing low cost electronics starting from soluble precursors that can be processed and patterned with a sustainable technology. A strong effort was devoted to the technological control of organic semiconductors, yet only a limited number of studies focused on new approaches for low-cost fabrication of electrodes and their integration with the organic materials.

We present Organic Field Effect Transistors (OFETs) obtained from solution processable materials by additive soft-lithographic techniques. The electrodes are fabricated by Microinject Molding in Capillaries [1], while the active layer is integrated with the contacts by Lithographically Controlled Wetting as nanostructured ultra-thin stripes [2]. Electrical measurements reveal that these nanoengineered OFETs exceed the performance of their counterparts made with standard microfabrication approaches. Our method enables different materials to be fabricated and integrated in a device using the same platform, thus contributing to a promising route towards large-area circuitry printing by additive manufacturing.

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[2] Cavallini, M.; Stoliar, P.; Moulin, J. F.; Surin, M.; Leclère, P.; Lazzaroni, R.; Breiby, D. W.; Andreasen, J. W.; Nielsen, M. M.; Sonar, P.; Grimsdale, A. C.; Müllen, K.; Biscarini, F. *Nano Lett.* **2005**, *5*, 2422-2425.