

# New Materials for Printed Opto-Electronic Devices: Synthesis, Charge Transport, and Process Engineering

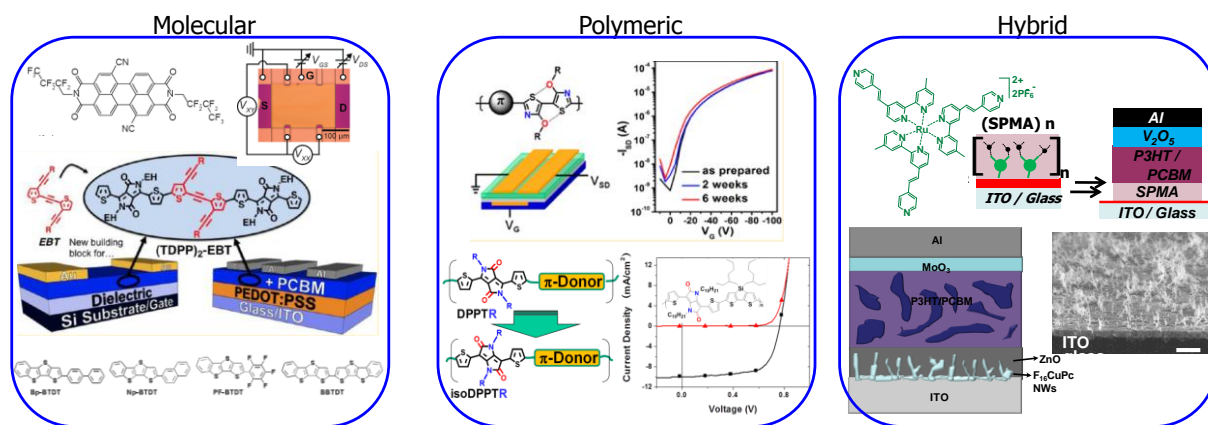
**Antonio Facchetti**

Department of Chemistry, Northwestern University and Polyera Corporation

2145 Sheridan Road, Evanston IL 60208, USA

Email: a-facchetti@northwestern.edu

Printed opto-electronics is a new technology envisioning the fabrication of opto-electronic devices using printing methodologies. In this presentation I will describe the materials development and process engineering enabling the fabrication of unconventional opto-electronic devices, such as displays, circuits, and solar modules, all on flexible foils using several new materials.<sup>1-3</sup> Examples of unconventional electronic materials include organic small molecular and polymeric semiconductors, metal chelates and complexes, and hybrid organic-inorganic metal oxides. Among the process development, I will discuss spin- and slot-dye coating, inkjet printing, and gravure printing. Finally, we report on charge transport characteristics of polymeric blends in various device architectures.



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Antonio Facchetti is a co-founder and the CSO of Polyera Corporation. He obtained a Ph.D in Chemical Sciences from the U. Milan (Italy) and carried out postdoctoral research at the University of California-Berkeley and at Northwestern University, where he is currently an Adjunct Professor of Chemistry. Dr. Facchetti has published more than 300 research articles, 7 book chapters, and holds about 60 patents. He received the 2009 Italian Chemical Society Research Prize, the team IDTechEx Printed Electronics Europe 2010 Award, and he is a 2010 Kavli Fellow, a 2012 American Association for the Advancement of Science (AAAS) Fellow, and a 2013 Materials Research Society (MRS) Fellow. He was selected among the "Top 100 Materials Scientists of the past decade (2000-2010)" by Thomson Reuters. Dr. Facchetti's research interests include organic semiconductors and dielectrics for thin-film transistors, conducting polymers, molecular electronics, organic second- and third order nonlinear optical materials, and organic photovoltaics.