

Department of Biomedical Engineering

Seminar Series

Engineering of Unconventional Materials for Flexible Optoelectronics. Transistors, Solar Cells, Batteries, and Sensors

Prof. Antonio Facchetti

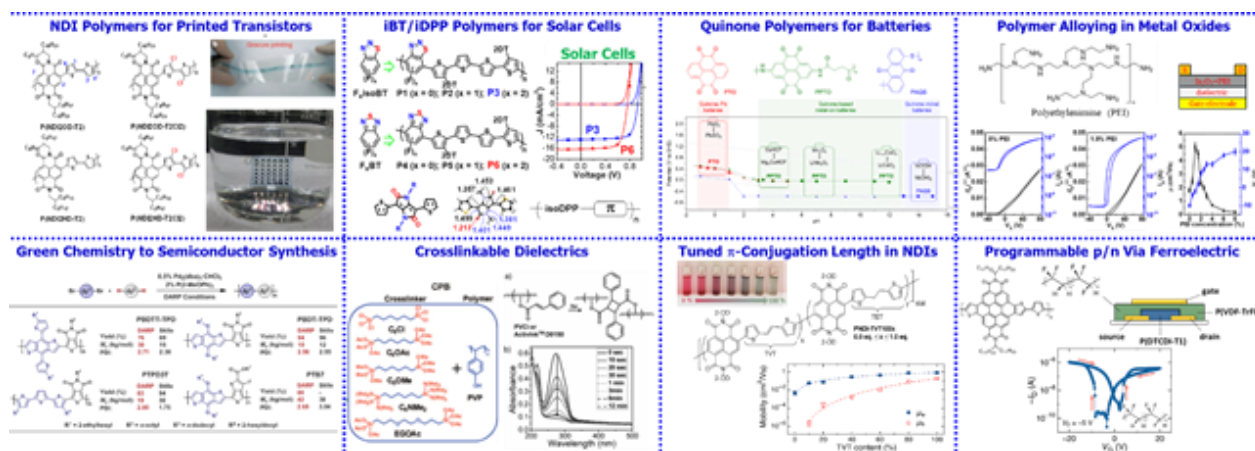
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Date:	January 9, 2019 (Wednesday)
Time:	11:00am - 12:00noon
Venue:	B6605 CSE Conference Room, Yeung Kin Man Academic Building

Abstract

In this presentation we will describe the design rationale, synthesis, characterization of several organic semiconducting and dielectric materials for printed/flexible thin-film transistors (TFTs),(1-5) circuits,(4) photovoltaic cells (PVs),(6,7) batteries(8), and SERS sensors (9) as well as to understand their charge-transport/performance characteristics as a function of the device architecture and interface modifications (Fig. 1). We will also briefly summarize our recent synthetic efforts for the sustainable synthesis of semiconducting polymers.(10,11) as well as new processing methodologies (12). Finally, new approaches to understand

how the degree of π -conjugation in semiconducting polymers affect charge transport will be reported.(13) Our materials enable the realization of printed TFTs with mobilities $> 3\text{-}40\text{ cm}^2/\text{Vs}$, OPV cell with efficiencies $>12\%$, aqueous batteries with specific capacities $> 395\text{ mAh g}^{-1}$, and organic SERS with unprecedented scattering enhancements.(14)



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Biography

Antonio Facchetti obtained his Laurea degree in Chemistry cum laude and a Ph.D in Chemical Sciences from the University of Milan. In 2002 he joined Northwestern University where he is currently an Adjunct Professor of Chemistry. He is a co-founder and currently the Chief Technology Officer of Flexterra Corporation. He has published more than 450 research articles, 12 book chapters, and holds more than 120 patents (H-index 93). He received the 2009 Italian Chemical Society Research Prize, the team IDTechEx Printed Electronics Europe 2010 Award, the corporate 2011 Flextech Award. In 2010 was elected a Kavli Fellow, in 2012 a Fellow of the American Association for the Advancement of Science

(AAAS), in 2013 Fellow of the Materials Research Society, in 2015 he became a Fellow of the Royal Society of Chemistry, and in 2016 a Fellow of the ACS Polymeric Materials Science and Engineering. In 2010 he was selected among the "TOP 100 MATERIALS SCIENTISTS OF THE PAST DECADE (2000-2010)" by Thomson Reuters and in 2015/2016/2017 recognized as a Highly Cited Scientist. In 2016 he has been elected a Fellow of the National Academy of Inventors and was awarded the 2016 ACS Award for Creative Invention. In 2017 he was awarded the Giulio Natta Gold Medal from the Italian Chemical Society for his work on polymeric materials.

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All are Welcome!

BME Seminar 2018-2019/009