



# Università degli Studi di Roma “Tor Vergata”

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**Dipartimento di Scienze e Tecnologie Chimiche**

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## **AVVISO DI SEMINARIO**

*Martedì 31 Ottobre alle ore 14.30  
in aula Seminari del  
Dipartimento di Scienze e Tecnologie Chimiche, la*

**Dr.ssa Alessandra Operamolla**

**Dipartimento di Chimica,  
Università degli Studi di Bari Aldo Moro  
Bari (Italy)**

**Terrà un seminario dal titolo:**

**Exploring new functionalizations and biomaterials for bulk-heterojunction polymer solar cells**

Proponenti: Proff. Laura Micheli, Valeria Conte

## Abstract:

Two different aspects, related to the design and performances of new photovoltaic devices based on organic materials, are presented.

On the side of the organic semiconductor role,<sup>1</sup> in connection to previous studies on design, synthesis and functionalization of novel organic materials,<sup>2</sup> conjugated structures with pending thioacyl groups have been synthesized as candidates for ternary blend polymer solar cells. Such materials could not only optimize the active layer morphology, but contribute by means of their conjugated structure to light harvesting and charge generation processes operating in the solar cell. Their study in all organic or hybrid nanostructures represents an unexplored dimension in new generation photovoltaics. Their synthesis is presented and followed by comprehensive studies on their photovoltaic response in dependence of the presence of a sulfur containing peripheral functionality linked to the conjugated backbone.

Considering the aspect of device architecture, the field of organic electronics is continuously in progress and poses new challenges, including the fascinating opportunity not only to extend the features of organic materials by functionalization, but also to access environmentally benign devices by integration of biopolymers in the device structure. This is an extremely attractive opportunity, opening access to relevant applications as multi-functional, bio-compatible and sustainable devices. In particular, Cellulose Nanopaper (CNP), a free standing film of cellulose nanocrystals, represents an environmentally harmless substrate for paper electronics.<sup>3</sup> Functionalization chemistry on the surface of nanopaper can be used to modulate its environmental stability. Indeed, hydrophobization dramatically improves the water resistance yielding ideal substrates for electronic devices.<sup>4</sup>

## References:

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2. A. Operamolla, O. Hassan Omar, F. Babudri, G. M. Farinola, F. Naso, *J. Org. Chem.* 2007,72, 10272; O. H. Hassan Omar, F. Babudri, G. M. Farinola, F. Naso, A. Operamolla, *Eur. J. Org. Chem.* 2011, 529; A. Operamolla, A. Punzi, G. M. Farinola, *Asian J. Org. Chem.*, 2017, 6, 120.
3. F. Hoeng, A. Denneulin, J. Bras, *Nanoscale*, 2016, 8, 13131;
4. Project "SolarLeaf - Biodegradable organic solar cells supported on cellulose", financed by Regione Puglia within the program FutureInResearch.