

# Organic solar cells State of the art and outlooks



## Gilles Horowitz

Directeur de Recherche  
CNRS/LPICM,  
Professeur UPDD

**Lundi**  
**17 octobre**  
**2011**

**École Polytechnique**  
Amphithéâtre Carnot

Département de Mécanique

Although the photovoltaic effect was first coined by the French physicist Antoine Becquerel (X1806) in 1839, the commercialization of solar cells only emerged during the last decade, fostered by the global energy crisis. Today, most of the cells are made of single crystal or multicrystalline silicon, with power conversion efficiencies ranging between 15 and 20 %. However, silicon has a major drawback: It only weakly absorbs solar light, so that large thicknesses (ca. 100  $\mu\text{m}$ ) are needed in solar cells. The main research effort to find alternatives is directed towards thin film devices, with the leading role devoted to inorganic compounds such as hydrogenated amorphous/nanocrystalline silicon, Cu(In, Ga)Se<sub>2</sub> or cadmium telluride (CdTe). The field of organic solar cells started in the late 1980's by the application of organic pigments, but since the turn of the 21st century, they have been replaced by polymer semiconductors, resulting in encouraging improvements. The aim of this seminar is to present the current status of the field of organic solar cells. Focus will be made on the specificity of organic semiconductors, and on the potentiality they offer in terms of production technology.



<http://www.coriolis.polytechnique.fr>