# PHOTOSENSITIZATION OF CARBON NANOTUBES USING PHOTOSYNTHETIC PROTEINS TO OPTOELECTRONIC APPLICATIONS

*Grégory Schmidt, Bernard Lagoutte, Winfried Leibl,*
*Jean-Philippe Bourgoin and Pascale Chenevier*

*Service de Physique de l'Etat Condensé (CNRS URA 2464)*
*CEA Institute Radiation Matter of Saclay*
*91191 Gif sur Yvette (France)*
*gregory.schmidt@cea.fr*

To face up the challenge of climate change and environmental issues, the applied renewable energy research field is rapidly expanding. Hence, during the last ten years, the organic photovoltaic cells performances have made significant progresses. The current limits of these systems are mainly due to the low quantum yield of dyes and the speed of charge transport towards electrodes. To raise the power conversion yield of organic photocells to the level of silicon technology, an innovative bio-hybrid using carbon nanotubes and a photosynthetic protein as “super dye” has been assessed. Indeed this protein optimized by nature during millions of years has exceptional optical properties (quantum yield of 1) that may prove to enhance dramatically performances of optoelectronic and photovoltaic devices. To validate the potential of this protein, we perform a carbon nanotubes field-effect transistor optically controlled by photosynthetic proteins.