Press Release

The role of exciton lifetime for charge generation in organic solar cells at negligible energy-level offsets*: a collaborative work with the participation of NHRF researchers was published in *Nature Energy

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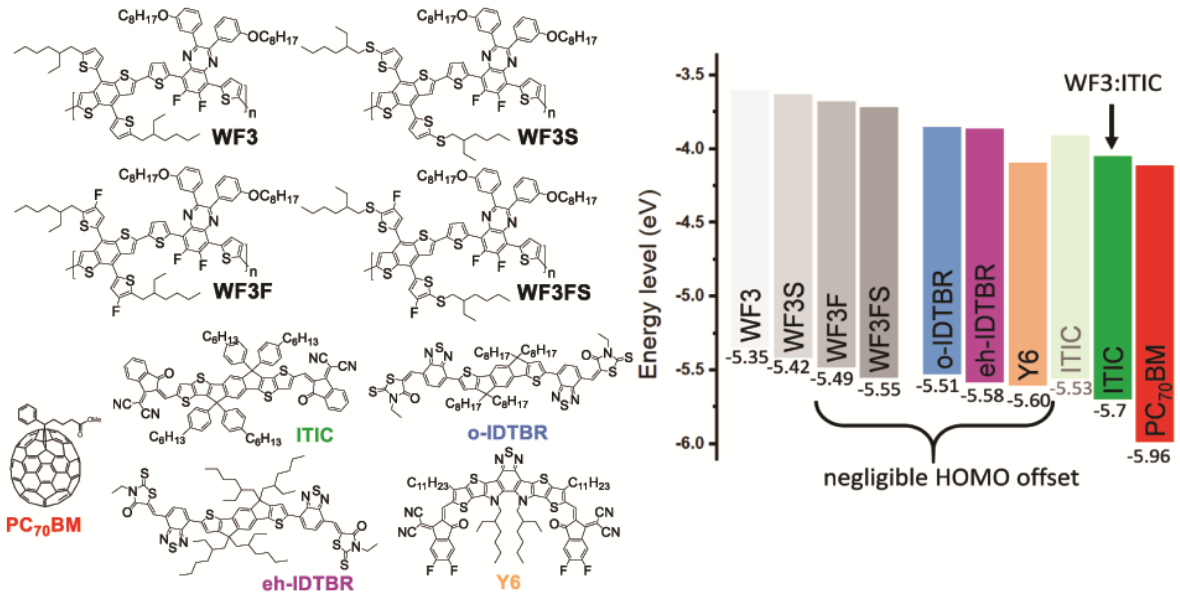
An exceptionally important work on highly efficient organic solar cells was published in the leading international journal **Nature Energy (IF: 46)**, with the contribution of researchers of the **National Hellenic Research Foundation (NHRF)**.

Dr. Christos Chochos and **Dr. Vasilis Gregoriou** in collaboration with researchers from **Advent Technologies SA**, the Institute of Materials for Electronics and Energy Technology (i-MEET), **Friedrich-Alexander University Erlangen** in Germany, the **University of Oxford** in the **United Kingdom** and the **KAUST Solar Center (KSC)** at King Abdullah University of Science and Technology (KAUST) in Saudi Arabia discovered the role of a characteristic property of organic electronic materials (conjugated polymers and small molecules), which had not been observed before with great impact on the development of highly efficient organic solar cells.



Organic solar cells (OSCs) are produced by printing solutions of organic semiconductor materials at ambient temperature, are flexible, cheaper and lighter. In addition, their installation or incorporation into a final product is much easier compared to silicon solar cells. Organic solar cells have been already

used in commercial products (e.g. gadgets), as an alternative energy source instead of a regular battery.

What has not been completely clear to date is how the excitons are split (pairs of positive and negative charges) and, therefore, how the power is generated in organic solar cells consisting of conjugated polymers and a specific class of organic materials, the so-called non-fullerenes derivatives.

The results of this work highlight that the long lifetime of the exciton is the key to achieving effective separation of positive and negative charges and that the development of new such materials will contribute to the future increase in the energy efficiency of solar cells which today reaches about 18% on a laboratory scale, namely larger than amorphous silicon, while approaching the efficiencies of solar cells from perovskite. This will help organic solar cells in the future to integrate into other commercial products requiring more power or energy to operate.

Link to the article: https://www.nature.com/articles/s41560-020-00684-7