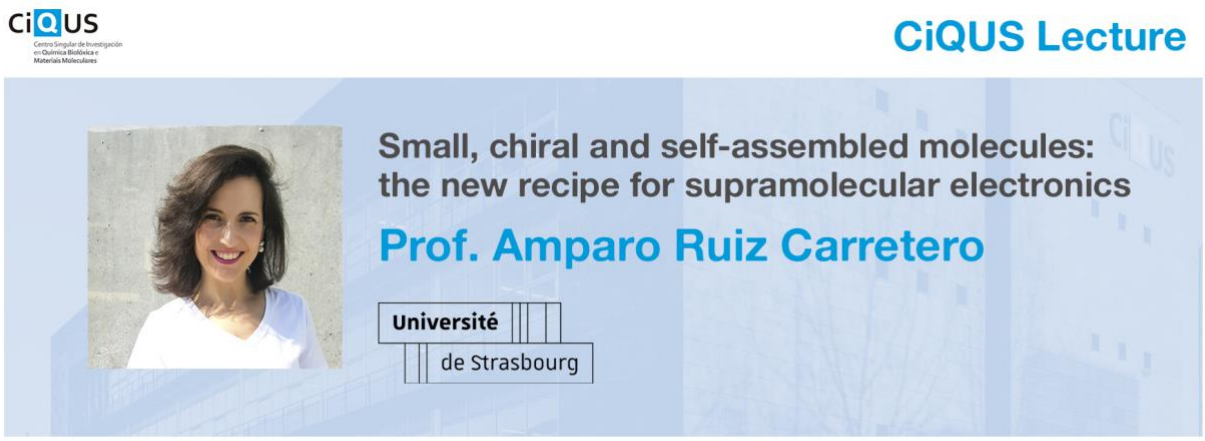

Prof. Amparo Ruiz Carretero
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Abstract

Providing global energy supply in a sustainable manner is one of the main challenges of our generation. We are therefore, in the urge to find alternative resources and materials. In this sense, organic materials are the best candidates to fabricate electronic devices since we can tailor their properties by molecular design. They have other advantages such as flexibility, light weight, portability and scalability. Still, the efficiency of organic devices is far from the one of inorganic materials or perovskites. Despite the progress made in the field, the race for achieving efficiency records, has hampered research focused on solving other fundamental issues, such as device morphology and charge recombination. In this seminar, I will show different strategies to demonstrate how noncovalent interactions can enhance charge transport and device efficiency in organic photovoltaic devices (Figure 1a).[1] In our group we incorporate hydrogen bonds to extraordinarily small semiconductors to enhance charge carrier mobility and lifetime[,2,3] and introduce chiral centers to explore the Chiral Induced Spin Selectivity (CISS) effect to decrease charge recombination.[4] The synthesis, self-assembly and optical properties will be shown and correlated to the charge transport results obtained by using electrodeless techniques and full devices. The spin selectivity results explored by scanning tunnel microscopy (STM) on spectroscopy mode (STS), show how it is possible to guide charge carriers through opposite chirality supramolecular structures (Figure 1b).[4]

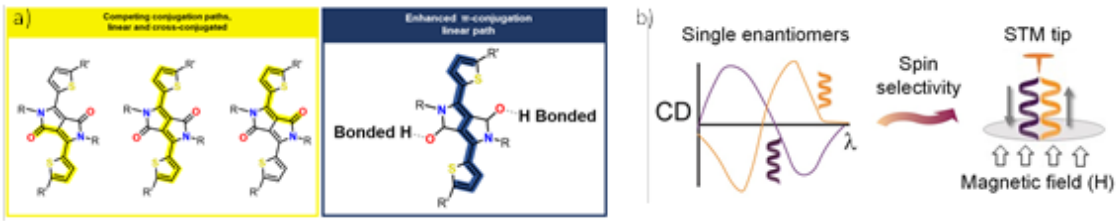

Figure 1. *Strategy to enhance charge transport in small molecules. b) Study of the CISS effect using STM on STS mode*

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Biosketch

Amparo Ruiz Carretero is a “Chargée de Recherche” (Associate Professor) at the Institute Charles Sadron (CNRS) in Strasbourg (France). She studied chemistry at the University of Castilla – La Mancha (Spain), where she obtained her PhD under the supervision of Prof. A. de la Hoz and Dr A. Sanchez. She spent a big part of her PhD in the group of Prof. E. W. Meijer and Prof. A. Schenning. Afer postdocts in the groups of Prof. S. Stupp (Northwestern University) and Prof. L. De Cola (University of Strasbourg), she obtained her current CNRS position in 2015, where she leads the SYCOMMOR (Systemes Complexes Moleculaires et Macromoleculaires Organises) team since 2022. Her research interests include the study of hydrogen-bonded semiconductors, supramolecular chirality and spin dynamics in charge transport properties. In 2023 she received the CNRS bronze medal that recognizes the work of researchers at the beginning of their career and their ability to get settled and recognized in the scientific community.