CiQUS

Centro Singular de Investigación en **Química Biolóxica** e **Materiais Moleculares**

Lecture:

Molecular Spins in 2D Materials

Prof. Eugenio Coronado

Institute for Molecular Science (ICMol) – Spain

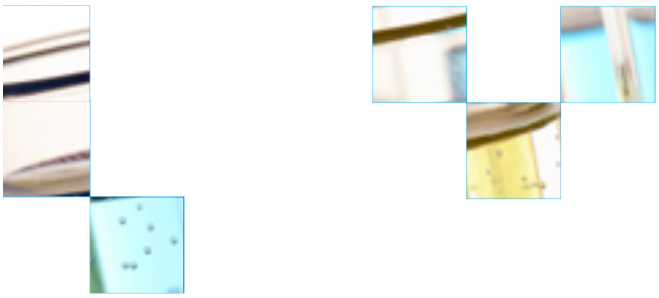
10/01/2020

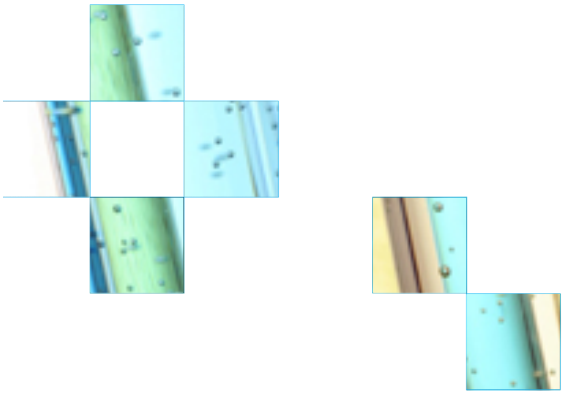
.....

CiQUS Seminar Room

12:15 h

Más información:
www.usc.es/ciqus





XUNTA DE GALICIA
CONSELLERÍA DE CULTURA, EDUCACIÓN E ORDENACIÓN UNIVERSITARIA

Santander Universidades

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

CAMPUS VIDA
CAMPUS DE EXCELENCIA INTERNACIONAL

Prof. Eugenio Coronado[a]

[a]*ICMol-Univ. Valencia, 46980 Paterna, Spain, e-mail: eugenio.coronado@uv.es*

Short biography: Eugenio Coronado is Professor of Inorganic Chemistry at the Universidad de Valencia and Director of the Institute for Molecular Science (ICMol) and of the European Institute of Molecular Magnetism (EIMM). Expert in Molecular Magnetism, his recent research interests lie in the areas of Molecular Spintronics, quantum computing and 2D magnetic materials. To develop these research lines, he has been financed by the European Research Council (ERC) since 2009 with the ERC Advanced grants SPINMOL and MOL-2D.

With over 600 publications amassing >30.000 citations and an H-index of 84, his scientific impact has been recognized in Spain and abroad through various research prizes. That includes the Prize of research in New Technologies "Rey Jaume I" (2003), the National Prize of research in Chemical Sciences (2009), the medal of the Spanish Royal Society of Chemistry (2009) and the medal of the Royal Society of Physics (2019), among others. In Europe he has been nominated member of the Academia Europaea (2009) and has been the recipient of a Van Arkel Chair in the Leiden Institute of Chemistry (2003) and a "Blaise Pascal" International Chair in France (2014).

Lecture: Molecular spins in 2D materials

Apart from being used in the chemical functionalization of 2D surfaces, the use of molecules to generate novel classes of 2D materials has been scarcely investigated. In this talk the impact of molecules in the 2D area will be discussed, paying particular attention to the molecular magnetic materials.[1] In the first part I will focus on the design of molecular 2D magnets that, in contrast to what happens with the inorganic 2D magnets, are chemically stable in open air, keeping their magnetic properties preserved upon functionalizing their surface with different organic molecules.[2] In the second part I propose to create hybrid heterostructures by interfacing a layer of a functional molecular material with a 2D material. The aim is that of tuning the properties of the "all surface" 2D material *via* an active control of the hybrid interface.[3] To reach this goal the molecular system of choice will be based on spin-crossover complexes able to switch between two spin states upon the application of an external stimulus (temperature, light or pressure). This concept will provide a new class of stimuli-responsive molecular/2D heterostructures, which may be at the origin of a novel generation of hybrid materials and devices of direct application in highly topical fields like electronics, spintronics or molecular sensing.

References

1. E. Coronado. *Nature Rev. Mater.* 2019, DOI: 10.1038/s41578-019-0146-8
2. J. Lopez-Cabrelles *et al. Nature Chem.* 2018, **10**, 1001
3. J. Dugay et al. *Nano Lett.* 2017, **17**, 186