



## CRC Seminar Series

**DATE:** 25 March 2021  
**TIME:** 3:00 PM – 5:00 PM  
**LOC:** Online Zoom Meeting



### GUEST SPEAKER:

**Prof. Eugenio Coronado**

ICMol Institute at the University of Valencia, Spain

### TITLE:

**"Interfacing 2D materials with magnetic functional molecules"**

### ABSTRACT:

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.<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> 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.* 2020, 5, 87
2. J. Lopez-Cabrelles *et al.* *Nature Chem.* 2018, **10**, 1001
3. J. Dugay *et al.* *Nano Lett.* 2017, **17**, 186

## **PROFILE OF PROF EUGENIO CORONADO:**

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 materials. In this last topic his research focuses on the design of 2D molecular magnets and hybrid molecular/2D heterostructures combining functional molecules with 2D superconductors and magnets, as well as in the use of these materials for applications in spintronics. To develop these research lines he has been financed by the European Research Council (ERC) with the Advanced grants SPINMOL and MOL-2D.

With over 630 publications amassing >35.000 citations and an H-index of 90, his scientific leadership has been recognized in Spain and abroad through various research prizes, including the medals of the Spanish Royal Societies of Chemistry (2009) and Physics (2019), a "Blaise Pascal" International Chair in France (2014) and a Humboldt research award in Germany (2020).