

## Neutron scattering: basics concepts and examples related to energy storage systems



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### **Abstract**

Neutron scattering techniques can provide fundamental insight into the different behaviors shown by matter. In this lecture, a short introduction of the properties of the neutron–matter interactions and the fundamentals of neutron scattering will be presented in order to facilitate an understanding of the peculiarities of this probe. Also the different modalities the scientists have to access to these interesting techniques will be introduced. Then, selected examples will be presented of the use of different neutron scattering techniques on very different problems related with Li ion batteries and other materials related with the energy challenge.

### **Bio**

Javier Campo (Physicist) made his doctoral thesis, titled “Low anisotropy antiferromagnetic dilutions”, at the Aragón Materials Science Institute (ICMA), joint research institute between the Spanish National Research Council (CSIC) and the University of Zaragoza, in 1995. Later he moved to the University of Montpellier where he made a post-doctoral stay of 2 years working on the physics of hexagonal GaN wide gap semiconductor. From 1998 to 2002 Dr J Campo was appointed by the CSIC as scientist responsible for the CRG-D1B at the Institute Laue Langevin (ILL) in Grenoble (France) and in 2003 he joined the ICMA as a researcher under the prestigious Spanish talent program “Ramón y Cajal” where he continued heading the Spanish CRG at the ILL, including the CRG-D15 and the new XtremeD instruments. He was Director of the ICMA from 2012 to 2020. His scientific interest is focused on the study of “Magnetic Chirality” and “Purely organic magnets” by using neutron scattering techniques and recently he started to work on “in operando studies of materials for energy applications” by using also neutron and Xray scattering. Javier Campo is the author of more than 180 scientific papers and main researcher in more than 55 research projects. He has supervised 8 doctoral theses and has held several international membership, among others; Presidency of the Spanish Neutron Scattering Association 2006 to 2014, vice-presidency

of the European Neutron Scattering Association (ENSA) from 2009 to 2014, Spanish delegate at the ILL Steering Committee since 2008, Chair of the VI European Conference on Neutron Scattering held in Zaragoza in 2015, member of the international advisory board of Global Institute for Materials Research Tohoku (Japan) since 2023, international advisory board of the Dan Beninson Institute of Nuclear Technology (Argentina) since 2021, and Chair of the Spanish Committee for Large Scale Scientific Facilities since 2019.