Contribution ID: **447** Type: **Talk (25 + 5 min)**

Field-induced phase transitions in $Yb_3Fe_5O_{12}$

Wednesday, March 22, 2023 4:30 PM (30 minutes)

Yttrium iron garnet ($Y_3Fe_5O_{12}$) has, since its discovery in 1957, fundamentally contributed to the development of important research fields such as spintronics, magnonics and hybrid quantum information systems. Iron garnets incorporating magnetic rare-earth ions are relatively less well-known, but have also been studied for their interesting spin transport phenomena, magnetoelectric properties and magneto-optical effects. Following our zero-field work on the complete spectrum of $Yb_3Fe_5O_{12}$ [1] we extend our study to understand the effect of magnetic fields on the low energy magnetic excitations of the compound. A notable observation is a magnetic phase transition that takes place when the field is applied along the <111> crystallographic directions relative to the cubic unit cell. Using new, extensive inelastic neutron scattering data, we show how magnetic fields up to 7 T influence the hybridised 4f–3d magnetic excitations of the compound, and describe how the new experimental findings may be described within the magnetic model we recently developed for $Yb_3Fe_5O_{12}$ [1].
[1] V. Peçanha Antonio et al. Phys. Rev. B **105**, 104422 (2022)

Author: Dr PEÇANHA-ANTONIO, Viviane (University of Oxford)

Presenter: Dr PEÇANHA-ANTONIO, Viviane (University of Oxford)

Session Classification: Bulk Magnetism 1

Track Classification: Magnetism, Superconductivity, Topological Systems, Magnetic Thin Films an other electronic phenomena