

**Thursday 23 November, 2pm**

## **About non-Kramers magnetic states: Time-reversal properties and anisotropies of a bound-ion**

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Magnetic anisotropies of rare-earth ions characterise unconventional phases in many condensed matter systems. The theoretical effort for describing such phases typically begins with the "tuning" of suitable *pseudo-spin* Hamiltonians which can account for complex exotic behaviours and yet involve simple enough mathematics. A case per se are *non-Kramers* bound-ions whose spectra features a neat separation of the lowest energy states from the higher ones.

In this talk, focusing on non-Kramers magnetic ions, I will discuss the relationship between *time-reversal* properties and the origin of axial anisotropies. Emphasis will be given to identifying the *microscopic* mechanisms of interest from well established theoretical frameworks [1,2]. The analysis will be contextualised in the perspectives of recent experimental findings from the garnet  $\text{Tb}_3\text{Ga}_5\text{O}_{12}$  [3], which is known for detection of *phonon Hall* physics [4].

### References

- [1] A. Abragam and B. Bleaney, *Electron Paramagnetic Resonance of Transition Ions* (Clarendon Oxford, 1970).
- [2] J. S. Griffith, *Physical Review* 132, 316 (1963), URL <https://link.aps.org/doi/10.1103/PhysRev.132.316>.
- [3] R. Wawrzynczak and collaborators, In preparation (2017).
- [4] C. Strohm, G. L. J. A. Rikken, and P. Wyder, *Physical Review Letters* 95, 155901 (2005), URL <https://link.aps.org/doi/10.1103/PhysRevLett.95.155901>.