



# IFMP Seminar

**Date** Monday, July 07, 2025, at 14:50

**REC/C213**

**Zoom:** 688 4227 2214, Passcode: IFMP2024-5

**Speaker** **Aurore Finco**

*Université de Montpellier, France*

**Title** **Exploring spin waves and complex magnetic textures with scanning NV-center microscopy**

**Abstract** In this presentation, I will show two different approaches to probe spin waves using a scanning NV microscope. The first is relaxometry, which allows the detection of thermal spin waves through the magnetic noise they produce. This noise accelerates the relaxation of the NV center, and is directly visible in the emitted photoluminescence, revealing the position of domain walls in which low-frequency spin-wave modes are confined. I will also demonstrate how this qualitative method can be used to determine the handedness of magnetic textures and therefore the sign of the underlying Dzyaloshinskii-Moriya interaction. In the second approach, we excite spin waves with a coplanar wave guide. When they are resonant with the magnetic transition of the NV center, the microwave stray field that they generate drives this transition. This mechanism can be probed directly with ODMR, or more quantitatively with Rabi oscillations. This method allows, for example, the mapping of propagating spin waves. I will illustrate this technique with the exploration of nonlinear frequency-multiplication phenomena in microstructured Py films.

Finally, I will also present results about the imaging of complex magnetic textures, and how we can analyze stray field maps to extract information about them. In particular, I will focus on the stabilisation of magnetic vortices at room temperature in microstructures of the van der Waals magnet Fe<sub>5</sub>GeTe<sub>2</sub>.

Host: A. Singha