



## II NanoFrontMag Scientific Workshop

### *Topological Antiferromagnetic Spin-orbitronics*

Jairo Sinova

Antiferromagnetic spintronics considers the active manipulation of the antiferromagnetic order parameter in spin-based devices. An additional concept that has emerged is that antiferromagnets provide a unifying platform for realizing synergies among three prominent fields of contemporary condensed matter physics: Dirac quasiparticles and topological phases. Here spintronic devices made of antiferromagnets with their unique symmetries will allow us to control the emergence and to study the properties of Dirac/Weyl fermion topological phases that are otherwise principally immune against external stimuli. In return, the resulting topological magneto-transport phenomena open the prospect of new, highly efficient means for operating the antiferromagnetic memory-logic devices. We discuss how these topological phases emerge and how their robustness depends on the relative orientation of the Neel order parameter that can be manipulated by Neel spin-orbit torques. Their natural excitations are in the THz but with the additional consideration that they can now be directly tuned.