Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **2835** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

Size bistability in multiferroic nanoparticles

Wednesday 5 June 2019 12:00 (15 minutes)

Most multiferroic materials with coexisting ferroelectric and magnetic order exhibit cycloidal antiferromagnetism with wavelength much larger than lattice spacing. The prototypical example is bismuth ferrite ($BiFeO_3$ or BFO), a room-temperature multiferroic considered for a number of technological applications, including magnetic memories with electric-write capability. While most applications requires small sizes such as nanoparticles, little is known about the state of these materials when their sizes are comparable to the cycloid wavelength. This work describes a theory of cycloid magnetism in nanoparticles. It is argued that magnetic anisotropy close to the surface has a huge impact on the ground state cycloidal wavevector, leading to several observable consequences. For certain sizes the cycloidal wavevector is bistable, an effect that may be exploited in the design of novel memory devices.

Authors: Mr ALLEN, Marc (University of Victoria); AUPIAIS, Ian (Université Paris Diderot); Dr CAZAYOUS, Maximilien (Université Paris Diderot); Prof. DE SOUSA, Rogério (University of Victoria)

Presenter: Mr ALLEN, Marc (University of Victoria)

Session Classification: W1-9 Condensed matter systems & related: experiment & theory (DCMMP) | systèmes de matière condensée et expérience et théorie connexes (DPMCM)

Track Classification: Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)