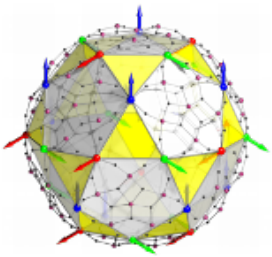

Contribution ID: **4** Type: **Keynote**

Magnetic Neutron Scattering Studies on Permanent Magnets

Wednesday, 5 June 2019 15:00 (1 hour)

Nd-Fe-B-based permanent magnets have been continuously investigated for the last three decades due to their technological relevance as materials used in energy-related applications (e.g., motors and wind turbines). A crucial issue is the understanding of the magnetization-reversal process, which eventually may result in the preparation of dysprosium and terbium-free Nd-Fe-B alloys with characteristic magnetic parameters (coercivity, remanence, maximum energy product) that guarantee their performance also at the high operating temperatures of motors (up to 200 °C). In order to achieve this goal, the combination of advanced characterization techniques such as aberration-corrected high-resolution transmission electron microscopy and three-dimensional atom-probe tomography with ab-initio calculations and numerical micromagnetic modeling is required. Indeed, recent studies along these lines have provided important information regarding the nature (chemical composition, crystalline structure, ferro- or paramagnetic) of the intergranular Nd-rich phases in Nd-Fe-B magnets (including nanocomposites), which decisively determine the coercivity mechanism of these materials. In this talk we will discuss how magnetic neutron scattering, specifically small-angle neutron scattering, can contribute to the understanding of the microstructure-property relationship of Nd-Fe-B magnets and we will give an outlook on rare-earth-free Mn-Bi magnets.

Primary authors: MICHELS, Andreas (University of Luxembourg); MALYEYEV, Artem (University of Luxembourg)

Presenter: MICHELS, Andreas (University of Luxembourg)

Session Classification: Novel rare-earth free permanent magnets

Track Classification: Novel rare-earth free permanent magnets