SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

05 maja 2021 r., o godz.10:00

odbędzie się seminarium **on-line (link podany jest na stronie IF PAN)**,

na którym

Prof. Dr. Manuel Angst

Jülich Centre for Neutron Science JCNS and Peter Grünberg Institut PGI, JARA-FIT, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany

wygłosi referat na temat:

"Revealing the Absolute Direction of the Dzyaloshinskii-Moriya Interaction in Prototypical Weak Ferromagnets by Polarized Neutrons"

The magnetic properties of materials, important for many applications, are determined by fundamental magnetic interactions between the ions. In addition to the "normal" (symmetric) exchange interaction with energy $\propto \mathbf{S}_1 \cdot \mathbf{S}_2$, there sometimes a weak antisymmetric exchange interaction ($E \propto \mathbf{S}_1 \times \mathbf{S}_2$) depending on relativistic spin-orbit coupling. This so-called Dzyaloshinskii-Moriya Interaction (DMI) was first proposed in the 1950s to explain weak ferromagnetism (WFM), the small canting of otherwise collinear antiferromagnetic structures leading to a small net magnetization, in α-Fe_2O_3 and other materials [1]. The DMI is currently attracting significant interest because it is present in many complex magnetic structures and is the driving force in stabilizing various novel topological magnetic structures such as spin spirals, magnetic skyrmions, or magnetic soliton lattices [2]. The absolute direction of the DMI is often a decisive factor in determining the system's chirality in both bulk and interfaces and the knowledge of both is required for the design of functional heterostructures [3]. While the determination of the absolute direction of the DMI arising at interfaces is routinely done with Brillouin light scattering, and the DMI in bulk systems featuring spirals with neutron scattering methods, the experimental determination of the absolute DMI-direction in WFM is challenging. A complex resonant x-ray scattering technique had recently been proposed and applied to $MnCO_3$ [4]. In this seminar, I will present a method to use polarized neutron scattering that was recently developed and used to determine for the first time the absolute direction of the DMI in classical α-Fe_2O_3 [5]. The application of the method to further WFM of various crystal symmetries will also be discussed.

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Serdecznie zapraszamy

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