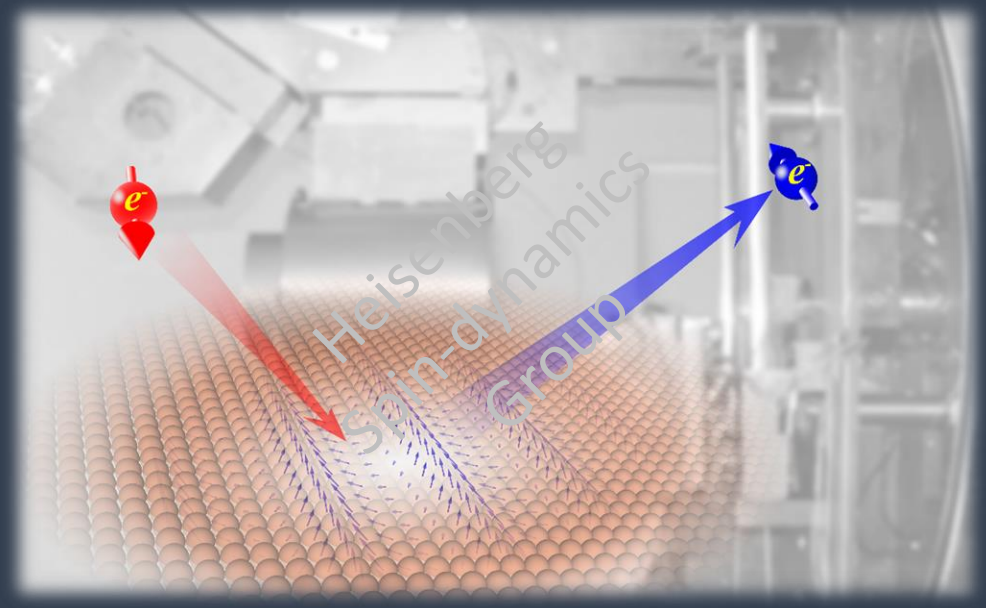
Design of atomic-scale magnonic crystals

Project description

In the emerging field of magnonics, the central idea is to use the elementary collective magnetic excitations (magnons) for encoding or transmitting information. The first step for using terahertz magnons in magnonics is to design a template on which different magnon modes can be excited and manipulated.



← Terahertz magnons in ultrathin films can be excited by spin-polarized electrons.

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Our idea is to suggest a way of designing atomic scale magnonic crystals for terahertz magnonics based on multilayer thin films. The central point of this project would be to experimentally design magnetic multilayers, composed of alternating atomic layers of ferromagnetic metals, in which different magnon modes can be efficiently excited.
The sample preparation and all the analysis will be performed under ultra-high vacuum. The magnetic excitations shall be investigated by our unique spin-polarized high-resolution electron energy loss spectrometer.

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