



## Open PhD Position:

### Spectroscopy of Skyrmions by Brillouin Light Scattering

Skyrmions, chiral magnetization textures with sizes ranging from a few nm up to micrometers, are in the focus of today's research because of their fundamental physical properties as well as for applications. In the recent years, the existence of Skyrmions, even at room temperature, has been demonstrated in a wide set of material systems. The eigenmodes of these objects are of large interest, since their spectrum potentially contains unique information on the Skyrmion texture and the related material parameters. Also for applications, the excitations of Skyrmions are of large relevance. In terms of the [DFG Priority Program Skyrmionics: Topological Spin Phenomena in Real-Space for Applications](#), [AG Magnetismus at TUK](#) aims to use Brillouin Light Scattering (BLS) to perform room-temperature Spectroscopy of Skyrmion eigenmodes. With the ultimate sensitivity of BLS, we intend to study the thermally excited excitations of Skyrmions as well as the response to external driving forces.

The project will be directed by two principle investigators (Dr. Philipp Pirro and Dr. Thomas Brächer). The PhD position is on a three-year basis (75% of a full-time researcher position E13).

#### Outline of the project:

- Spectroscopy of spin-wave eigenmodes in Skyrmion lattices and at individual Skyrmions
- Excitation of Skyrmion dynamics by radio-frequency magnetic fields and spin currents
- External stimulation of Skyrmions by DC spin torques

To fulfill these tasks, the PhD student will be trained in the following techniques:

- Brillouin Light Scattering spectroscopy
- Ferromagnetic Resonance Spectroscopy
- Micromagnetic Simulations
- Microstructured sample fabrication in a clean-room environment

#### The candidate should possess:

- Basic knowledge about Magnetism – knowledge about Spin waves, Magnetisation dynamics and/or Skyrmions is a plus
- Basic experimental skills – experience in Labview or Python programming, Microfabrication and/or Magneto-optical techniques is a plus
- Self-motivation, ability to work with an open mind in a highly collaborative environment, very good English proficiency, German proficiency is a plus but not strictly required

AG Magnetismus currently consists of about 35 researchers, among which are 15 PhD students. We offer a welcoming, international working atmosphere, with good possibilities to travel in the framework of international collaborations and to visit international conferences. Since the project is part of the priority program, the candidate will be embedded in a collaborative network, including theory support. The official PhD supervisor will be Prof. B. Hillebrands with day-to-day supervision by the PIs Dr. Philipp Pirro and Dr. Thomas Brächer.

If you are interested, please send your application including CV and motivation letter to [braecher@rhrk.uni-kl.de](mailto:braecher@rhrk.uni-kl.de).

