

## MA 40: Walter Schottky Prize Award (PV IX)

Time: Wednesday 15:00–15:30

Location: HSZ 04

**Prize Talk**

MA 40.1 Wed 15:00 HSZ 04

**Magnon transport in spin textures** — •HELMUT SCHULTHEISS  
— Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam  
Physics and Materials Research, Bautzner Landstrasse 400, 01328  
Dresden, Germany — Laureate of the Walter-Schottky-Prize

One of the grand challenges in cutting edge quantum and condensed  
matter physics is to harness the spin degree of electrons for informa-  
tion technologies. While spintronics, based on charge transport by  
spin polarized electrons, made its leap in data storage by providing  
extremely sensitive detectors in magnetic hard-drives, it turned out  
to be challenging to transport spin information without great losses.  
With magnonics a visionary concept emerged: Utilize magnons - the

excitation quanta of the spin system in magnetically ordered materials  
- as carriers for information. Magnons are waves of the electrons\* spin  
precessional motion. They propagate without charge transport and its  
associated Ohmic losses, paving the way for a substantial reduction of  
energy consumption in devices. In this presentation, I will present our  
recent highlights on magnon propagation and manipulation in non-  
collinear spin textures. In particular, I will outline how magnons can  
be steered in magnetic microstructures by locally generated magnetic  
fields [1] and how magnetic domain walls serve as magnon nanochan-  
nels [2].

[1] K. Vogt, et al., Nature Comms. 5, 3727 (2014).

[2] K. Wagner, et al., Nature Nanotech. 11, 432 (2016).