On-line SPICE-SPIN+X Seminars

SPIN PHENOMENA INTERDISCIPLINARY CENTER

SPIN+X SFB/TRR 173 Kaiserslautern • Mainz

Wednesday, 20th October 2021, 15:00 (CET)

The seminar will be via Zoom (Meeting ID: 814 2210 6342) and live streamed in the SPICE YouTube Channel.

Achim Rosch,
University of Cologne

Archimedean screw and time quasi-crystals in driven chiral magnets

The Archimedean screw is one of the oldest machines of mankind. We show theoretically [1] how one can realize and drive such an Archimedean screw in chiral magnets, where helical spin textures are realized. A small oscillating magnetic field at GHz frequencies induces a net rotation and screw-like motion of the magnetic texture. This effect arises from the coupling of the oscillating field to the Goldstone mode of the system. The Archimedean screw can be used to transport spin and charge and thus the screwing motion is predicted to induce a large voltage in metallic systems. Using a combination of numerics and Floquet spin wave theory, we show that the helix becomes unstable upon increasing the oscillating field forming a `time quasicrystal' which oscillates in space and time for moderately strong drive.

[1] Nina del Ser, Lukas Heinen, Achim Rosch, SciPost Phys. 11, 009 (2021).