Physikalisches Kolloquium — Physics Colloquium

Einladung — **Invitation**

Monday, 17 May 2021

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Imaging the properties of Atoms and Fields at the Atomic Scale inside materials and devices

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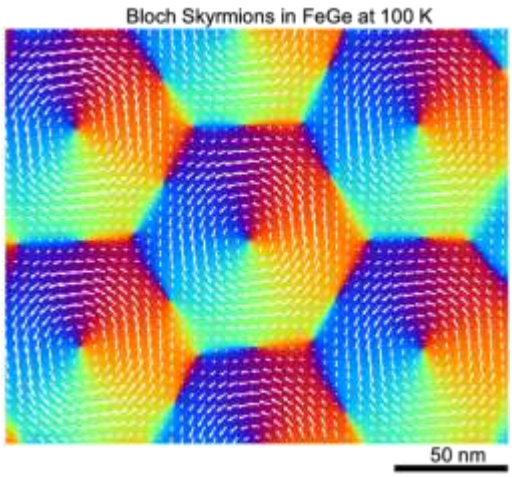
The past three decades have seen the rapid development and maturation of aberration-corrected electron lenses. With our recent advances in detector technology and reconstruction algorithms, the resolution of the electron microscope is now limited by the dose to the sample, and thermal vibrations of the atoms themselves. By recording the full position-momentum phase space, and using ptychographic algorithms to solve the multiple-scattering inverse problem, we have been able to improve the dose efficiency of the imaging beyond all other electron microscopy methods, and equally important, the highest resolution images ever recorded, with the possibility to locate individual dopant atoms in 3D. These approaches have also allowed us to image strain in devices, magnetic fields in sub-nm thick layers, as well as the internal structures of both magnetic and ferroelectric vortices, skyrmions and merons, including their singular points that are critical for accurately describing the topological properties of these field textures.



Host: Prof. Dr. Ute Kaiser, Electron Microscopy Group of Materials Science

Organisation: Prof. Dr. Jens Michaelis, Institute of Biophysics, jens.michaelis@uni-ulm.de, +49-731-50-23050