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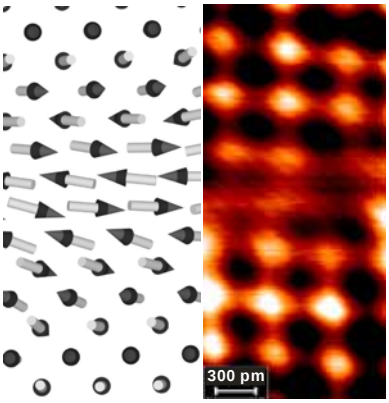
Research Summary

My research activities are mainly focused on the correlation of structural, electronic, and magnetic properties of nanostructures and surfaces. In the past I have mainly worked with scanning tunneling microscopy (STM) and various spectroscopic techniques, including spin-polarized STM. It allows atomic spin resolution which resulted in the first image of an antiferromagnetic domain wall (see image). Recent results also include the direct observation of superparamagnetic switching events on single nanoparticles and the detailed investigation of electronic properties.



Selected Publications

"Atomic spin structure of antiferromagnetic domain walls," M. Bode, E. Y. Vedmedenko, K. von Bergmann, A. Kubetzka, P. Ferriani, S. Heinze, and R. Wiesendanger, *Nature Materials* **5**, 477 (2006)

"Shape-Dependent Thermal Switching Behavior of Superparamagnetic Nanoislands," M. Bode, O. Pietzsch, A. Kubetzka, and R. Wiesendanger, *Phys. Rev. Lett.* **92**, 067201 (2004)

"Thickness-Dependent Magnetization States of Fe Islands on W(110): From Single Domain to Vortex and Diamond Patterns," M. Bode, A. Wachowiak, J. Wiebe, A. Kubetzka, M. Morgenstern, and R. Wiesendanger, *Appl. Phys. Lett.* **84**, 948 (2004)

"Spin-Polarized Scanning Tunneling Microscopy," M. Bode, *Rep. Prog. Phys.* **66**, 523 (2003)

"Direct Observation of Internal Spin-Structure of Magnetic Vortex Cores," A. Wachowiak, J. Wiebe, M. Bode, O. Pietzsch, M. Morgenstern, and R. Wiesendanger, *Science* **298**, 577 (2002)

M. Bode, S. Heinze, A. Kubetzka, O. Pietzsch, X. Nie, G. Bihlmayer, S. Blügel, and R. Wiesendanger: Magnetization-Direction Dependent Local Electronic Structure Probed by Scanning Tunneling Spectroscopy, *Phys. Rev. Lett.* **89**, 237205 (2002)

"Observation of Magnetic Hysteresis at the Nano-Scale by Spin Polarized Scanning Tunneling Spectroscopy," O. Pietzsch, A. Kubetzka, M. Bode, and R. Wiesendanger, *Science* **292**, 2053 (2001)

"Experimental Evidence for Intra-Atomic Non-Collinear Magnetism at Thin Film Probe Tips," M. Bode, O. Pietzsch, A. Kubetzka, S. Heinze, and R. Wiesendanger, *Phys. Rev. Lett.* **86**, 2142 (2001)

"Real-Space Imaging of Two-Dimensional Antiferromagnetism on the Atomic Scale," S. Heinze, M. Bode, A. Kubetzka, O. Pietzsch, X. Nie, S. Blügel, and R. Wiesendanger, *Science* **288**, 1805 (2000)

"Temperature Dependent Surface Electronic Structure of a Local-Moment Magnet: Tb(0001)," M. Bode, M. Getzlaff, A. Kubetzka, R. Pascal, O. Pietzsch, and R. Wiesendanger, *Phys. Rev. Lett.* **83**, 3017 (1999)

"Spin-Polarized Vacuum Tunneling into the Exchange-Split Surface State of Gd(0001)," M. Bode, M. Getzlaff, and R. Wiesendanger, *Phys. Rev. Lett.* **81**, 4256 (1998)