

EINLADUNG

zum Vortrag
von

Prof. Dr. Ekhard K. H. Salje

Department of Earth Sciences, University of Cambridge, UK

über

Domain boundaries as active physical and chemical elements for memory devices

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Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien
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Abstract:

I will discuss the idea that domain boundaries, rather than domains, can carry information and act as memory devices. Domains are bulk objects; their large response to changing external fields is related to their change in volume which implies the movement of domain boundaries. In many cases, the design of 'optimal' domain structures corresponds to 'optimal' domain boundaries with parameters such as the domain boundary mobility, pinning properties and the formation of specific boundaries such as curved boundaries or needle domains. This argument is enhanced further in this review: domain boundaries themselves can host properties which are absent in the bulk, they can be multiferroic, super- or semi-conductors while the matrix shows none of these properties. It is argued that multiferroic walls can be described formally as chiral whereby the chirality relates to state-vectors such as polarization and magnetic moment and their (non-linear) coupling. Once such walls can be generated reliably, a new generation of devices with much higher storage density than ever produced before can be envisaged.