

Großes Physikalisches Kolloquium an der Universität zu Köln



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16³⁰ Uhr
HS III

The matter of future computers

Although neuromorphic computing concepts have been put forward half a century ago, the urgency for low power solutions that can handle big data efficiently is a recent development. So far, cognitive/brain-inspired computing is the only paradigm that can offer energy savings of several orders of magnitude. However, getting there requires a huge multidisciplinary effort and a holistic approach that starts with the use of devices with intrinsic plasticity. Here I will highlight how recent progress in materials science is opening the way for future cognitive devices giving examples from the research of my own group. In particular, I will present work on memristive devices with transition metal oxides, such as nickelates and manganites, as well as with novel nanoscale ferroelectrics based on HfO₂.