**Leveraging the richness of materials physics for resource-efficient information technologies**

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Conventional information technologies make use of various basic materials properties like electronic and optical conductance, insulation and the ability to switch materials between different electronic/magnetic states. Altogether this has lead to very impressive and powerful capabilities, still further progressing owing to advances in the control of materials synthesis and structuring.

However, materials physics has many more features to offer that can help in addressing one of the main challenges in information technologies, being the energy consumption. Think for example about unconventional ordering phenomena and phase transitions, topological effects or superconductivity. I will discuss various of these features in relation to information processing, by examples from work done at the University of Twente and elsewhere.