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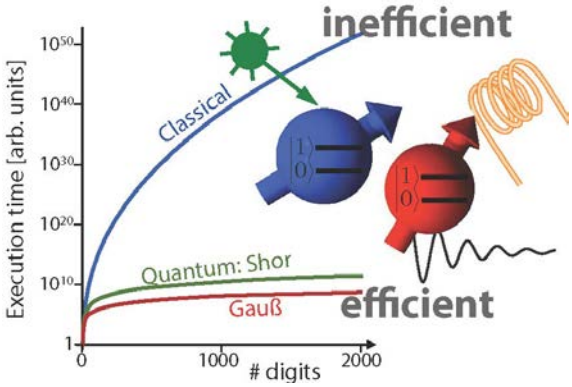
Physikalischen Kolloquium
Montag, 22.01.2018
16:15 Uhr in N24/H13

Professor Dr. Dieter Suter
Technische Universität Dortmund
Fakultät Physik
Lehrstuhl Experimentelle Physik III

Electronic and nuclear spins as building blocks for robust quantum computers

The exponential growth of digital electronics, known as the "digital revolution", has transformed many aspects of our lives, starting with information and communication technology. As this trend is approaching fundamental physical limits, new directions are explored for even more powerful computational devices operating by the laws of quantum mechanics. Such devices can solve problems that will remain out of reach for conventional computers. One of the main difficulties for their implementation is the fragility of information stored in coherent superpositions of quantum mechanical eigenstates. In addition, the fundamental laws of quantum mechanics make it impossible to use conventional error correction schemes, which require the duplication of information. The presentation will highlight the potential offered by quantum computers, as well as some of the difficulties that must be overcome to realise this potential. Techniques to overcome these obstacles include the protection of quantum states from environmental noise as well as the design of controls that enable robust processing: the resulting devices must operate flawlessly even in the presence of environmental noise and experimental imperfections. The specific examples rely on encoding the information in spin degrees of freedom and use established techniques from magnetic resonance for data processing.



Ab 16.00 Uhr Kaffee, Tee und Kekse vor dem Hörsaal H13
Organisation: **Prof. Dr. F. Jelezko, Tel. 23750**
Host: **Prof. Dr. O. Marti, Tel. 23011, off.: 23010**