SFB/TRR 21 - Colloquium

18. Oktober 2013, Stuttgart

Erik Gauger
(University of Oxford, UK)

Quantum Control, Information and Energy with Nanostructures

In this presentation I will cover recent theoretical work on harnessing the properties of quantum nanostructures with a view to designing new quantum technologies. In particular, I will present protocols for mediating spin-spin interactions through an optical degree of freedom in suitable hybrid systems. Further, I will discuss the prospects of spin chain wiring for realistic environments in diamond based quantum information processing architectures. Finally, I will show how the phenomenon of superradiance of light can be inverted with certain biomimetic nanostructures and given a modest level of quantum control. The resulting effect of 'superabsorption' might enable novel classes of quantum enhanced sensors and energy transmission channels.

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Universität Stuttgart, NWZII, Raum 2.136
Pfaffenwaldring 57, 70569 Stuttgart

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