

SFB 1432

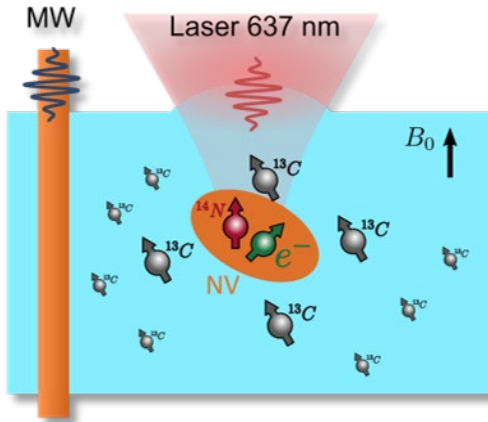
Colloquium

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Talk at 15:15
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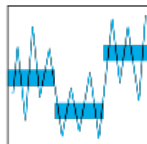
Dr. Vadim Vorobyov
Universität Stuttgart

NV center in diamond and V_{Si}^- in Silicon Carbide as a resource for quantum network applications



Contact:
Prof. G. Burkard, 5256

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Colour centers in diamond become one of the most successful platforms for realizing prototype quantum devices, such as quantum repeater nodes, small scale quantum registers, and quantum sensors. Silicon Carbide platform poses additional benefits in terms of multi species nuclear spin bath, technological readiness for semiconductor applications and more sophisticated polytypes.

The Vacancy of Silicon (V_{Si}^-) is a defect, which recently attracted attention, thanks to its resilience to optical spectral diffusion. It is speculated that it originates from the similarities of ground state and excited state orbitals, which leads to identical dipolar moment of two states, making it insensitive to the electric field fluctuations in first order.

A nearby nuclei could form a rich quantum system, if being well controlled and understood. In this talk recent advances in utilising NV center in diamond as a prototype quantum repeater node would be presented. In the second part of the talk latest results on study of V_{Si}^- based register formed with second shell Si-29 nuclear spin (8 MHz coupled) for quantum applications.