

## Multiparameter quantum sensing with nanoscale resolution

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Spin defects in wide band gap semiconductors enable quantum sensing with a spatial accuracy of a few nano meters. This leads to a variety of intriguing applications in material- as well as bio science. It turns out, that the sensor spin is sensitive to a number of external parameters and that dedicated Hamiltonian engineering renders the system sensitive to a particular quantity, like e.g. electric fields, temperature, pressure or magnetic fields [1]. The talk will demonstrate sensing of various quantities and discuss the enhancement of sensor performance using dedicated readout schemes [2,3] as well as quantum algorithms [4,5].

[1] C.L. Degen, R. Reinhard, P. Cappellaro Rev. Mod. Phys. 89, 035002 (2017)

[2] D.A. Hopper et al. Micromachines, 9, 437 (2018)

[3] J.F. Barry et al. arXiv:1903.08176v1 (2019)

[4] N. Aslam et al. Science 357, 67 (2017)

[5] M. Pfender et al. Nature Com. 10, 594 (2019)