

PhD Positions

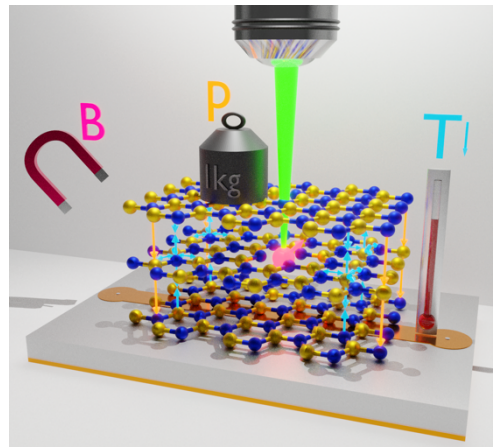
At the Chair of Experimental Physics 6, within the *Cluster of Excellence ct.qmat* and the *ERC Advanced Grant BoNi-SENS*, one PhD position and one PostDoc position are available now on the topic:

“Quantum Sensing with Spin Centers in hexagonal Boron Nitride”

Description of project:

The development of a solid-state system for quantum technologies and sensing applications is a very vibrant research area. An essential part of it, the spin degree of freedom, is an invaluable source of information as it provides an interface to the environment it is surrounded by. However, most of the material systems hosting spin centers are 3D and it is challenging to position them close to the sample surface. In 2020, our group experimentally identified the first intrinsic spin center in the 2D van der Waals material hexagonal boron nitride (hBN), in which coherent manipulation of spins was possible.

Our research goal is to realize vdW heterostructures by stacking multilayer 2D materials to study ordered systems incorporating hBN layers with spin defects written into it. The spin-sensitive method of choice is cw and pulsed optically detected magnetic resonance (ODMR) at different temperatures and magnetic fields. These functional hBN layers can be used as intrinsic sensors to probe the surrounding environment for local magnetic fields and electric fields, temperature and even lattice strain. In a broader perspective, vdW heterostructures and electronic devices based on them will also provide a tool to study fundamental scientific questions of 2D magnetism and/or phenomena driven by spin-orbit coupling at surfaces and interfaces through optical and electrical readout of the spin state.



Requirements:

We welcome applications from candidates with a Master degree in physics with top marks and with a background and interest in condensed matter, optical and spin-sensitive spectroscopy. Candidates must prove a strong attitude towards experimental physics and the drive and capacity to tackle different aspects of a complex problem with large independence.

Application:

The application should include a CV and a letter of motivation.

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