

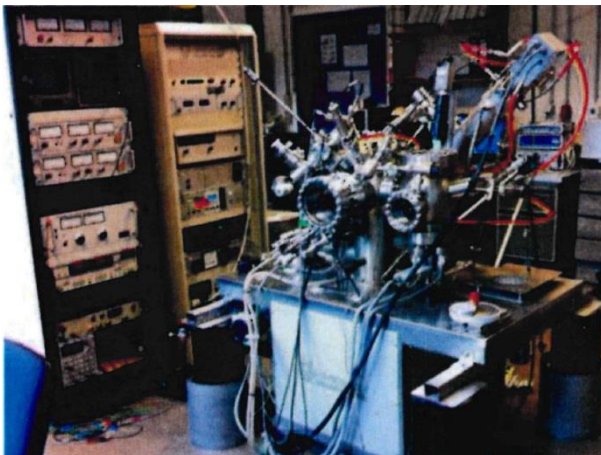
RWTH Aachen Physik

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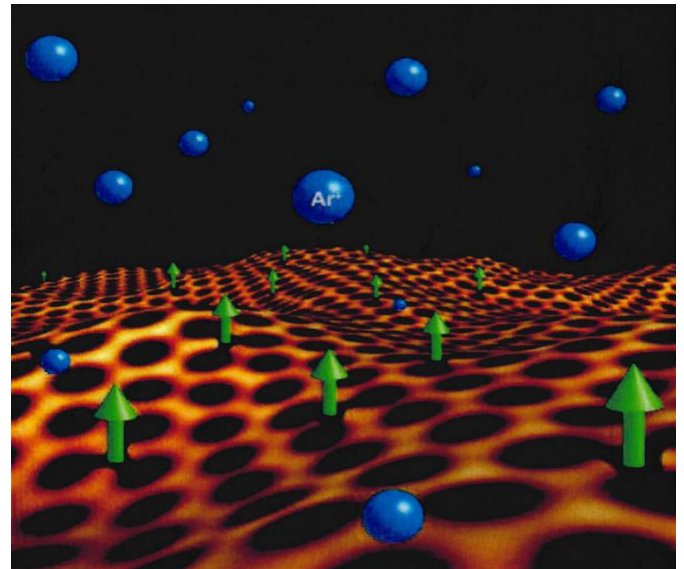
Master thesis

Vacancy induced magnetism in graphene

Using graphene vacancies as magnetic impurities might open the interesting possibility to combine the excellent transport properties of graphene with magnetic correlations and to provide stable coherent spin defects acting as spin qubits, which exploits the presumably excellent coherence properties of graphene.



UHV system with in-situ STM and argon plasma source used for preparation and characterization of graphene vacancies.



STM image of graphene on SiO₂. Vacancies produced by Ar ion bombardment and spins are shown schematically.

Within this master thesis, graphene single vacancies will be produced by ion bombardment in ultra-high vacuum (UHV) using an argon plasma source. This produced vacancies can be subsequently in-situ investigated by scanning tunneling microscopy and -spectroscopy (STM/STS).

By varying the ion flux and energy (controlled by a Wien-Filter) and beam time different defect densities of the graphene can be achieved and characterized with the STM.

This work is part of a collaboration between Aachen and the IFW Dresden (AG Kataev), where the prepared graphene samples are intended to be measured by electron spin resonance (ESR) for investigating the magnetic properties.

If you are interested in experimental work and would like to perform both sample preparation and (STM) measurements, please contact for further information:

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