DIAMANT

Thu, 2012-04-05 09:47 - [Lukas Theussl](#)   **Full Name:** Diamond based atomic nanotechnologies
Coordinator: Prof. Dr. Fedor Jelezko

Location

Universitaet Ulm Ulm Germany
48° 24' 15.4728" N, 9° 58' 45.6564" E
See map: [Google Maps](#)

Website:
http://www.uni-ulm.de/en/nawi/institute-for-quantum-optics/projects/eu-p...

Running time: 2011-01-01 - 2013-12-31

The ability to engineer materials at the level of single atoms is rapidly becoming an urgent practical requirement as new technologies demand ever smaller devices. However, such a capability also offers profoundly new functionality for molecular-scale devices. The DIAMANT team has pioneered the discovery and development of diamond as a uniquely promising material system for solid-state molecular technologies: Diamond has exceptional optical and magnetic properties that are associated with dopant complexes or solid-state molecules in the diamond lattice.

The DIAMANT project will develop new technologies to enable placement of exactly one atom at a time into a selected location in the diamond lattice with nanometre precision. Control of magnetic and optical interactions between single dopants will enable engineering of artificial molecules with radically new functionalities. Applications in the fields of sensing and imaging at the nano-scale, novel data storage and information processing will be developed both theoretically and experimentally. The ability to control magnetic interactions on the atomic scale will enable miniaturisation of electronic devices down to the ultimate size limit single molecules. We will manufacture photonic crystal cavities and plasmonic structures in diamond to realise the optical interfaces required for reading-in and reading-out information from these molecular-scale devices. Molecular sensors operating under ambient conditions promise to revolutionise the field of biological imaging and precision sensing. In the long term, determination the structure of single proteins will come within reach.

- [EC - FP7](#)
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