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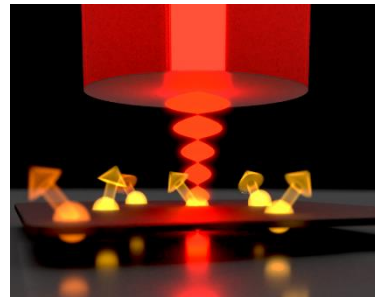
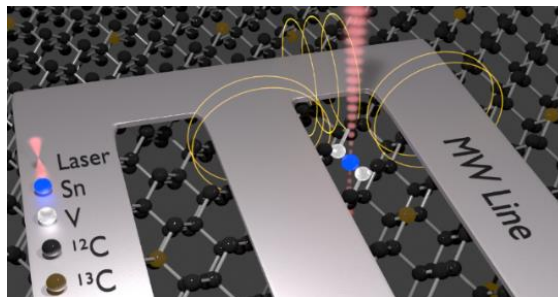
24.02.2025

## PhD Thesis: Spin control and spin-photon interface for SnV centers in diamond

**Color centers in diamond** are a promising material platform for the development of **quantum technologies** due to the exceptional coherence of their optical transitions and spin states.

In the group of Prof. Hunger, we are investigating **tin vacancy (SnV) centers** in diamond to realize long-lived optically addressable quantum memories [Karapatzakis et al., Phys Rev X 14, 031036 (2024)]. We incorporate color centers in optical microcavities to enhance light-matter interactions [Pallmann et al., Phys Rev X 14, 041055 (2024)].

In this project, we want to gain control over a few-qubit nuclear spin quantum register coupled to an SnV center to enable quantum error correction. Further, we aim to couple individual SnV centers to a microcavity to generate efficient spin-photon entanglement for quantum networks.



Left: Schematic drawing of a SnV center in diamond in a microwave waveguide. Right: Schematic drawing of a fiber-based microcavity with incorporated diamond membrane containing SnV centers.

You will gain experience in conducting experiments in a well-equipped **quantum optics lab**, with a large range of aspects to explore, including microcavity fabrication and operation, narrow-band lasers, millikelvin cryogenics, electronics & microwave instrumentation, programming, data analysis, and modelling.

**We're looking for a **creative** and **motivated** PhD student for this project!**

If you'd like to be a part of this project, send your **application** (or questions), to:  
Prof. David Hunger (david.hunger@kit.edu)

Applications should include your **curriculum vitae** and **academic records**.