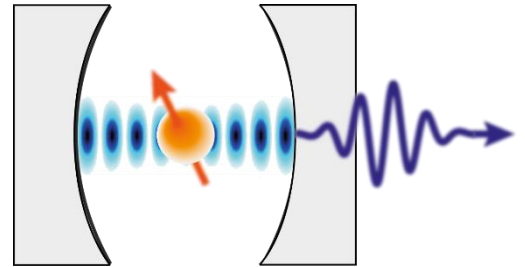


Doctoral Thesis

Cavity-enhanced readout of single rare earth ions

We are inviting applications for a PhD position in the group of Prof. David Hunger (PHI, KIT).

The offered project focuses on realizing an efficient optical interface for individual rare earth ions in solids with open-access optical microcavities. Rare earth ions provide exceptional optical and hyperfine coherence, which makes them promising candidates for quantum optical applications, ranging from quantum memories to quantum-nonlinear optics. However, the dipole-forbidden nature of the narrow transitions results in ultra-low emission rates, limiting most experiments to macroscopic ensembles. We want to gain efficient access to individual ions and small ensembles by coupling them to a high finesse optical microcavity. Purcell enhancement can boost the emission rate by several orders of magnitude, thereby making the weak transitions bright and enabling efficient state readout. We use microcavities based on laser-machined optical fibers as mirror substrates, which combine high Finesse with small mode cross sections and full tunability.



The project is funded within the European Union 7th Framework Program and will be a close collaboration with leading groups in the field of rare-earth ion spectroscopy.

We seek for a creative and motivated individual to advance this research project. Experience in the fields of quantum optics, cavity QED, or solid state spectroscopy is advantageous.

Applications should include

- a curriculum vitae (including details about previous research experience and skills, if applicable list of publications)
- academic records (Bachelor, Masters or diploma, including grades)
- an informal statement about your research interest (max. 1 page)
- contact information of at least one potential referee

For further inquiries and applications please contact Prof. David Hunger.