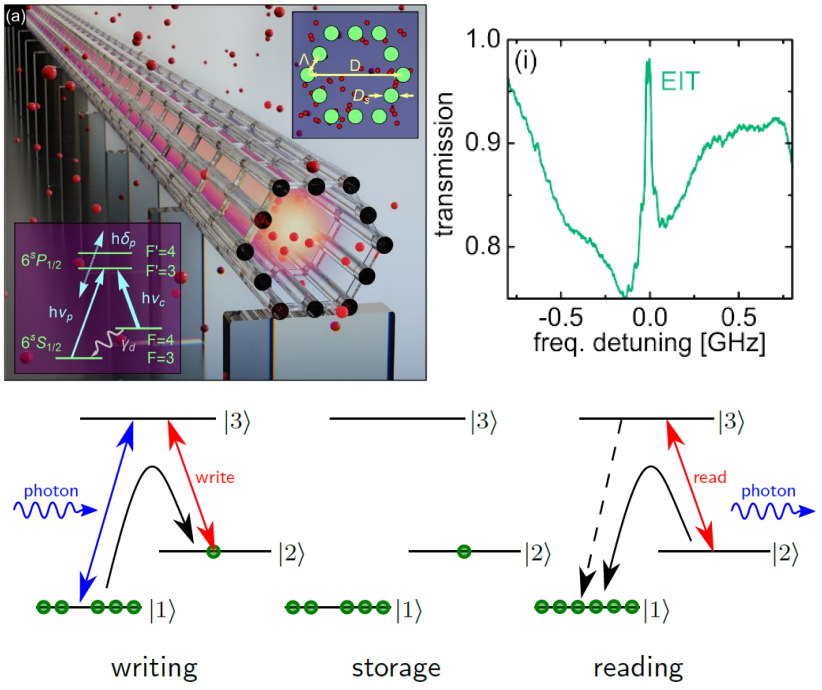
NANO OPTICS

Master's thesis

Trapping photons in a Light Cage

*In an increasing demand of global networks and the fast development of classical computers, keeping communications safe has become a key issue. Quantum networks, through Quantum Key Distribution Protocols (QKD), provide a truly secure way of encrypting messages. Nevertheless, QKD is limited due to the loss of quantum states in lossy channels like fiber optics. In this project we look to store quantum states in real atoms by interfacing light in a waveguide with warm atomic vapors. The waveguide, so called **light cage**, provides enhanced optical fields and easy access of the atoms into the structure. This aims to be a foundation stone of integrated on-chip quantum memories, so needed to overcome the loss in quantum networks.*

In this thesis light from coherent sources will be coupled into the Light Cage and its optical properties studied, leading to eventually trap light in this novel structure. As part of the project Python scripts will be developed to control the laser systems and other experimental equipment in order to acquire data, as well to analyze it. In order to extract in-depth physics behind the measured information, theoretical models that describe the occurring processes shall be numerically evaluated and compared.



This project is aimed to motivated students interested in both experimental and theoretical physics, that are eager to get hands on coherent light and matter interaction. Independent work is required. In return, we offer continuous support and close links to our experienced team.

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