Diamond photonics: Getting the most out of color centers

Color centers in diamond, i.e. atomic-scale, optically active defects in the diamond lattice, have received large recent attention as versatile tools for solid-state-based quantum technologies. They serve as qubits for quantum information, single photon sources for defining a new standard of luminous intensity (“quantum candela”) and are at the heart of very sensitive detectors for magnetic fields. A limitation of many current experiments with color centers in bulk diamond, however, is the typically small photon collection efficiency of a few percent only. I will present an overview on the most promising color centers for applications in quantum technology and routes for enhancing light extraction from diamond, i.e. micro-cavities and optical antennas.