



Das Institut für Optische Technologien lädt ein zum Kolloquiumsvortrag

Upconversion Nanocrystals: Synthesis, Quantum Yield and Bioanalytics

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Upconversion nanoparticles (UCNP) convert near infrared into visible light at much lower excitation densities than used in classic two-photon absorption microscopy and can therefore be excited with negligible background, providing exciting potential as light-controlled sensors and actuators of biological processes. Recently, a modified synthesis procedure was developed allowing to prepare $\text{NaYF}_4:\text{Yb,Er}/\text{NaYF}_4$ core/shell UCNP with different mean sizes under waterless reaction conditions. Absolute measurements of their photoluminescence quantum yield show that the quantum yield of 45 nm core/shell particles is already very close to the quantum yield of microcrystalline UC phosphors. UCNPs with dopant concentrations and core/shell structures optimized for higher excitation densities show efficient energy transfer (LRET) inside living cells. Due to their narrow size distribution, UCNPs form colloidal crystals, as confirmed by small-angle X-ray scattering (SAXS).

Einladender: Prof. Dr. Michael Schäferling

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