

PhOG Seminar

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Complex shaped plasmonic nanoparticles

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Abstract:

Here, I will address and discuss the plasmonic properties of two particular kinds of complex shaped nanoparticles, which manifest several plasmon resonances with strong polarization dependence, namely nanostars (Fig. 1 a) and sponge-like nanoparticles that consist of fully percolated gold and air filaments (Fig 1 b).

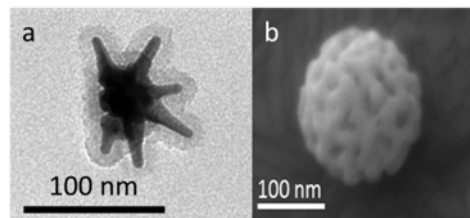


Figure 1 a. SEM image of silica coated gold nanostars and b. SEM images of a single gold nanosponge.

The correlation of the scattering spectra with the corresponding nanosponge morphology reveals that the plasmonic properties depend only weakly on the surface roughness, but are decisively influenced by the for each nanosponge unique 3D percolation.^[1]

Further, different strategies to modify the luminescence of gain materials upon addition of plasmonic nanostars are described, such as random lasing^[2] and substantially enhanced electroluminescence of OLEDs.

[1] C. Vidal, D. Wang, P. Schaaf, C. Hrelescu, T. A. Klar, *ACS Photonics* **2015**, *2*, 1436.

[2] J. Ziegler, M. Djiango, C. Vidal, C. Hrelescu, T. A. Klar, *Opt. Express* **2015**, *23*, 15152.