

Speaker Abstracts Karlsruhe Days of Optics & Photonics



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Control of Light at the Atomic Scale: Fundamentals and Applications

Plasmons in atomic-scale structures exhibit intrinsic quantum phenomena related to both the finite confinement that they undergo and the small number of electrons on which they are supported. Their interaction with two-level emitters is also evidencing strong quantum effects. In this talk we will discuss several salient features of plasmons in atomic-scale materials, such as graphene and atomic layers of noble metals. In particular, we will explore their ability to mediate ultrafast heat transfer, the generation of high harmonics, their interaction with molecules and quantum emitters, and their extreme nonlinearity down to the single-photon level. We will further analyze intriguing details in the plasmonic response of atomically-thin crystalline films of silver, the plasmons of which have been recently revealed experimentally.