

## **Engineering field enhancement and radiative decay in plasmonic antennas**

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Antennas represent probably the archetype of heavy-duty electrical engineering and have been extensively studied at microwave frequencies. In this presentation we will show how such classical components can be transposed into the nano-world to operate at optical frequencies. While optical antennas have similarities with their macroscopic counterparts, they also exhibit important differences. In particular, the excitation of plasmon resonances at optical frequencies in the metal leads to a strong optical field enhancement and localization when the antenna is used in reception mode. This enhancement can be evidenced using non-linear optical measurements on nanoscopic antennas. On the other hand, the interaction of such antennas with nano-emitters is of particular interest in the emission mode, where the field radiated by a molecule or a quantum dot can be enhanced or decreased by the presence of the antenna. A key issue in that context is the influence of the antenna on the radiative and non-radiative decay rates of the emitter.