

# Enhancing the Light-Matter Interaction with Optical Antennas

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Optical antennas are devices designed to efficiently convert optical radiation into localized energy, and vice versa. They enhance the interaction between light and matter, and have the potential to boost the efficiency of optoelectronic devices ranging from light-emitting diodes to solar cells.

In this presentation I will review the history of optical antennas and demonstrate their use for localizing optical radiation to length-scales much smaller than the wavelength of light. I will discuss experiments that use a single molecule as an elementary receiver and transmitter and demonstrate that the emission efficiency can be controllably increased by two orders of magnitude. I will also discuss the use of optical antennas for high-resolution optical microscopy and spectroscopy and review applications ranging from biology to solid-state physics.