

EINLADUNG ZUM
WIENER PHYSIKALISCHEN KOLLOQUIUM

**HOW TO SQUEEZE LIGHT INTO THE NANO-SCALE:
PUTTING THE NANO INTO PHOTONICS**

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Generations of students have been taught that light can be focussed down only as tight as a spot on the order of its wavelength. This several hundred nanometer scale limit would imply that nano-scale active elements cannot interact strongly with light. However this is untrue. Here we demonstrate the localisation of light tighter than 1nm. This has two principal benefits: spectroscopy can be used to probe such nano-scale architectures, and light can be concentrated to high intensity in ultra-small volumes. Both these have utility in a variety of new applications, which open up other areas of science. The key component for such manipulation of light is the intricate 3D construction of metallic composites. While current technologies for fabricating such nanostructures (for instance in electronics or IT) depend on surface lithographies, these are not well suited to the task as they are expensive, slow, inadequate for three dimensions, and ineffective. Thus a secondary focus of our work is the use of nano self-assembly to control rapid construction on the nanoscale. Such work goes hand in hand with our capabilities to measure what we have made through optics sensing.

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