NANYANG TECHNOLOGICAL UNIVERSITY
SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING
Doctor of Philosophy Abstract

Quantum Interferences with Nanostructured Metamaterials

By Charles Altuzarra

The ability to fabricate nanostructures by using chemical and physical processes can allow precise tuning of a material's optical properties.

This thesis explores the interactions between quantum states of light and nanostructured metamaterials. The experimental investigations constitute 1) the first quantum coherent perfect absorption experiment, 2) the nonlocal control of coherent perfect absorption with polarization entangled photons and 3) the focusing of quantum states of light past the diffraction limit through tailored interferences of a single photon.