



MASTER / BACHELOR

RESEARCH PROJECTS PLASMONICS

What's plasmonics?

In contrast to plain old dielectric materials, metals have mobile charge carriers (like a plasma). The charges can oscillate at optical frequencies. New solutions for surface waves are possible. These are surface plasmons.

Why plasmonics?

Plasmon wavelengths can be shrunken down to way below that of light in vacuum. This means plasmons can make super strong fields, which leads to interesting nonlinear optical properties. That's what we study.

Why do a project with us?

Take charge of your own experimental setup. Modify it. Learn how to work with powerful pulsed lasers and sensitive cooled detectors. Try your hand at nanostructuring samples. Program your experiment with LabView, and do some electronics, if you like. Do some numerical modelling with MatLab. The projects are flexible. **Do heaps, learn heaps.**

TOPICS WE ARE OFFERING RIGHT NOW

1. Opto-plasmonic coupler

We want efficient conversion of propagating light into a surface plasmon mode. But we also want the surface plasmon to have a sub-diffraction limited confinement zone. Will the Goos-Hänchen effect be important? Design and develop these special couplers. Have them built. Optically test their performance. Can you beat the world record?

2. Quantum plasmonic sensing

Surface plasmon resonance sensing (SPR) is widely used in the biological sciences to track the adsorption of minute quantities of chemical species onto a substrate. We have proposed a new detection method for SPR that provides sensitivity at the quantum noise limit.

Can you apply quantum SPR in the lab?

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