Prosjekt-eksempler

1. Mueller matrix spectroscopic ellipsometry of metal oxide nanopillars produced by ion abrasion of sol-gel films.

   - Including AFM,SEM and possibly 2nd harmonic generation microscopy

Image removed

Pre-requisites :

- Ability to understand tensors and biaxial systems in optics
- Basics of linear and nonlinear optical properties of materials
- Basics of polarisation description of light
- Solid background in maths and easy with matlab
  (may get mostly away with commercial software)
- Systematic and able to adapt to work with advanced instrumentation and fragile samples

Prosjekt i samarbeide med Lars Martin Sandvik Aas og St. Gobain(Paris)

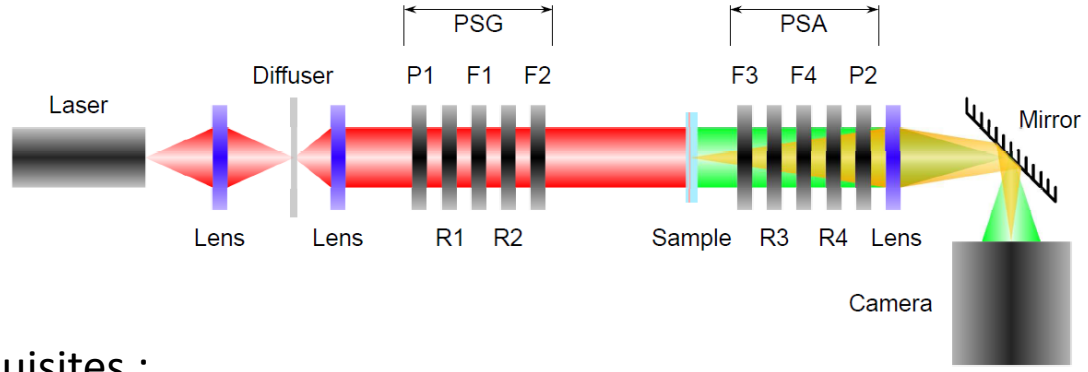
Contact: Morten.Kildemo@ntnu.no

Prosjekt-eksempler

2. Mueller matrix Imaging ellipsometry of stained collagen rich cartilage.

- Including possibly 2nd harmonic generation microscopy

The 4 by 4 transfer matrix of the Stokes vector is known as the Mueller matrix, ***M***, and is what we measure in the MMI setup.



Pre-requisites :

- Ability to understand tensors and biaxial systems in optics
- Basics of linear and nonlinear optical properties of materials
- Basics of polarisation description of light
- Easy with matlab, labview and instrumentation and lasers
- Systematic and able to adapt to work with advanced instrumentation and fragile samples

Prosjekt i samarbeide med P.G. Ellingsen og Magnus Lilledahl (biofysikk)

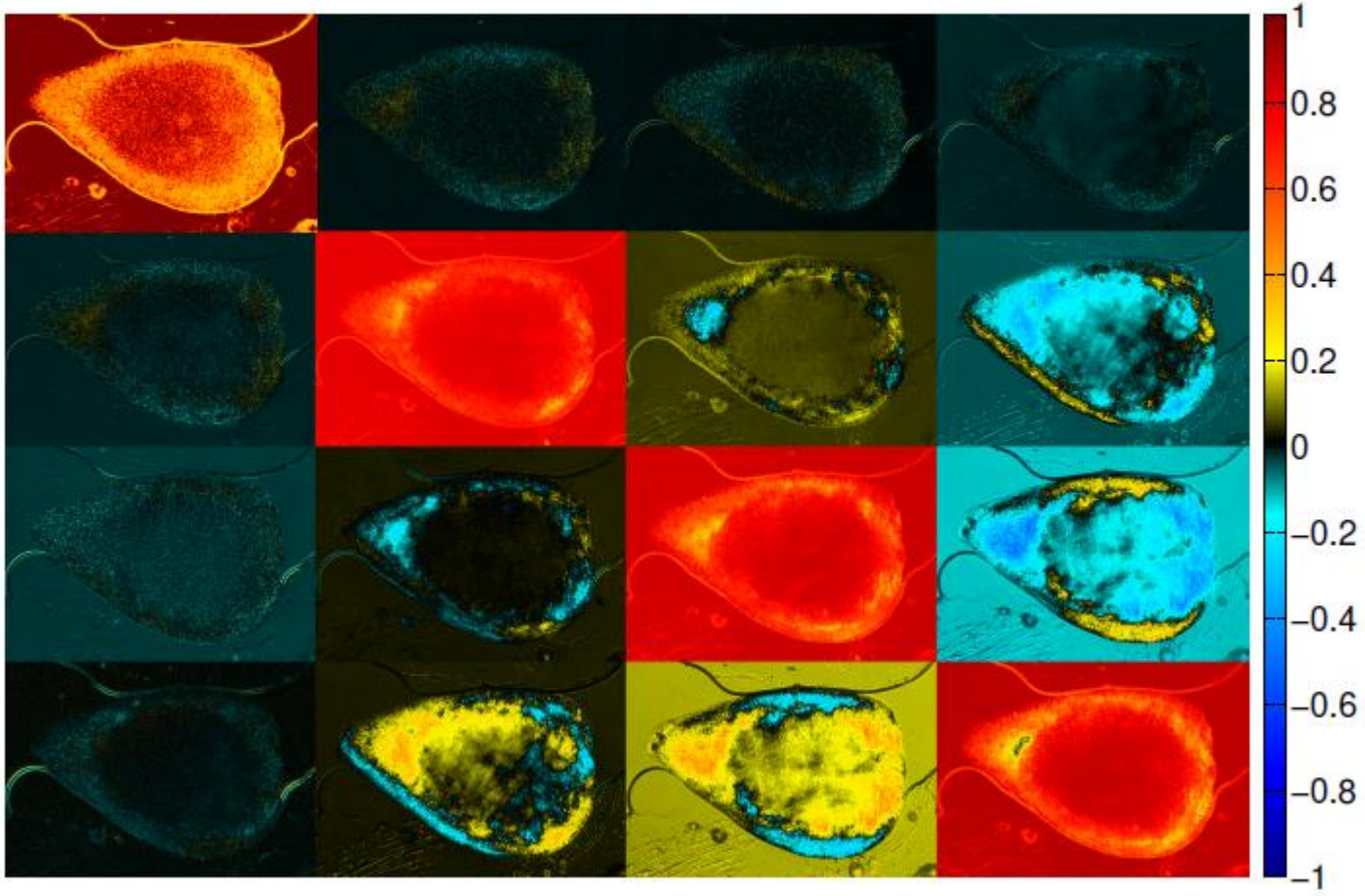
Contact: Morten.Kildemo@ntnu.no

Motivation for studying collagen in articular cartilage

- Osteoarthritis is the leading cause for disability in the US[1]
- Osteoarthritis is affected by a variety of factors among others genetic, traumatic, age and excessive loading [2]
- The main structure in the cartilage is collagen fibers

Contact: Morten.Kildemo@ntnu.no

Decomposing the Mueller matrix



Contact: Morten.Kildemo@ntnu.no

Prosjekt-eksempler

3. Mueller matrix scattering ellipsometry of rough surfaces combined with commercial scatterometry.

A new commercial scatterometer in combination with in-house built Mueller matrix scatterometer produces lots of new interesting data from light scattered from rough surfaces.

The problem is then to make a systematic study of this data, and to start understanding and evaluating the data.

In combination with AFM and profilometry (both within nanolab)

Pre-requisites :

- Basics of linear and nonlinear optical properties of materials
- Basics of polarisation description of light
- Solid background in maths and easy with matlab and Labview
- Systematic and able to adapt to work with advanced instrumentation

Prosjekt i samarbeide med Jerome Maria og Lars Martin Sandvik Aas

Contact: Morten.Kildemo@ntnu.no

4. Spectroscopic Ellipsometry of ZnS thin films produced by PLD and evaporation

- Including AFM, SEM, XRD, PLS

Prosjekt i samarbeide med Lars Martin Sandvik Aas og Turid Worren Renaas

Contact: Morten.Kildemo@ntnu.no