



Joint LLC Seminar

Thursday April 23, 15:15
The Rydberg Lecture Hall, Dep. of Physics

Edouard Berrocal

Div. of Combustion Physics, LTH

Improving visualization through scattering media using structured illumination

When probing a scattering medium composed of droplets, smoke, powders, or other aerosols, using a beam of visible light, photons interact several times with the randomly distributed particles. This multiple scattering of light is a complex phenomenon, commonly encountered but rarely desired. In imaging it induces strong blurring on the recorded photographs, limiting the range of applicability of modern optical instruments. It also introduces severe errors in laser-based measurements of particle size and concentration. A typical example concerns the laser diagnostics of spray systems. As a result of this limitation and despite large efforts over the past two decades, the spray community is still lacking detailed visualization of atomizing sprays. While different strategies - e.g. Time gating, Fourier filtering, Polarization filtering, X-ray radiography - have been developed and applied to remove/avoid effects induced by multiple light scattering, the use of structured illumination has turned out to be one of the most powerful and flexible solutions. In this talk a technique called SLIPI (Structured Laser Illumination Planar Imaging), where structured illumination is applied on a laser sheet imaging configuration, will be described. The capabilities of the approach will be demonstrated both for qualitative and quantitative visualization of spray systems. Possible use of SLIPI for the characterization of other scattering media will also be exemplified.

**The seminar is suited for a broad audience
and open for everybody**

**The Rydberg Lecture Hall is located at the Department of Physics,
Professorsgatan 1**

**Coffee and refreshments will be served
before the seminar, from 15:00**

