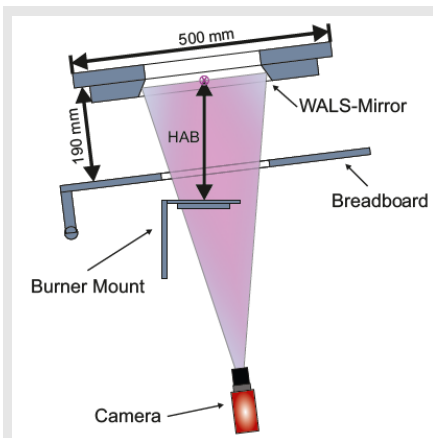


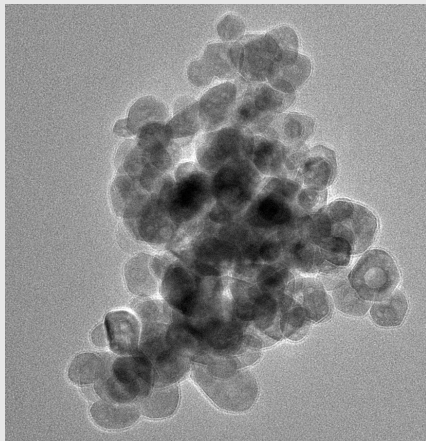
**Bachelor thesis/  
Project thesis/  
Master thesis**

## **Investigation of pulsations during spray flame synthesis of nanoparticles using wide-angle light scattering and flame self illumination**

Supervisor: Peter Lang  
Start: As of now  
Topics: Optical metrology, laser-induced  
incandescence



**Section through the WALS-mirror**



**TEM-image of a nanoparticle  
aggregate**

The central topic of the working group "Particle Measurement" of the Institute of Engineering Thermodynamics (LTT) is the investigation/development of suitable methods for the characterisation of nanoparticles.

Spray flame synthesis is a frequently used process for the production of functional nanoparticles in the gas phase and is characterised by a great diversity in terms of producible particle materials and morphologies. In this process, a liquid precursor substance is sprayed in a solvent and the spray is ignited, thereby converting the precursor and obtaining the desired particle material.

Due to fluctuations during the spray formation, pulsations of the flame and thus the particle synthesis can occur. The influences of these pulsations on the subsequent particle properties have hardly been investigated or understood. In this work, wide angle light scattering (WALS), which is used to determine the size and shape of nanoparticles, will be used to investigate the influence of pulsations on particle synthesis. For this purpose, the flame self-luminescence will be investigated with temporal and spatial resolution and correlated with the particle properties.

Students should have an interest in optical measurement technology and be able to work independently. Basic knowledge in the above-mentioned subject area is advantageous, but not mandatory.

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