

Broadband Cr:ZnS waveguide light source

Description

One of the recent break-through developments in laser science, which allowed to make a leap forward in the solid-state laser technology and extend it towards mid-infrared wavelength range, was development of a new class of laser materials based on transition-metal doped II-VI semiconductors, and in particular, development of the Cr:ZnS as the most promising among existing laser material for ultrabroad tuning, ultrashort pulse and continuum generation and power scaling in the mid-IR wavelength region.

The goal of the Master thesis is to explore the micro- and nanoscale dimension of these materials and to create novel active ion doped II-VI nanomaterials based waveguide lasers doped with chromium and other transition metal elements.

The project task will be designing and manufacturing in collaboration with the University of Hamburg and other leading international research centers of the Cr:ZnS waveguide, coupling it to a GaSb laser diode developed in the laboratory of Prof. Bjørn-Ove Fimland at IET, with the final aim to develop a novel, particularly compact ultrafast laser. The final laser assembly and tests will be done at the Laser Physics Group at NTNU, using Nanolab facilities.

- Optics and/or basic photonics related course(s) at the Physics Department or IET

- Supervisor's name and e-mail
Irina T. Sorokina, irina.Sorokina@ntnu.no

- Use of the NTNU Nanolab will be desirable.