Centrum HiLASE
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HiLASE Centre is pleased to invite you to attend the seminar:

Development of a cryogenic $Tm:Y_2O_3$ multi-pass amplifier in nanosecond regime

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Emerging applications, such as laser induced damaged threshold measurement, polymer material processing, debris removal from space, pump source for Mid-Infrared (Mid-IR) lasers, including ultrafast optical parametric oscillators based on non-oxide nonlinear crystals, etc., require compact high average and peak power (HAPP) laser sources emitting at the two-micron spectral range. To achieve two-micron lasing, Tm-doped Y_2O_3 transparent ceramics are promising active media for diode-pumped all solid-state lasers. The advantage of Tm ion is its efficient absorption around 800 nm, which can be pumped by commercial available AlGaAs laser. It also has two-to-one cross-relaxation process, which leads to much higher slope efficiency than the quantum defect limited value. The host material Y_2O_3 has very high thermal conductivity, a relatively low maximum phonon energy and sufficiently broad emission when doped with rare earth ions. However, this material suffers from reabsorption losses due to quasi-three level system at room temperature and other parasitic process such as exited state absorption (ESA) and energy-transfer upconversion (ETU), which limit the power scaling and beam quality of laser. To mitigate these issues, the active medium was cooled .

In this seminar, our preliminary studies on the structural and spectroscopic properties of $Tm:Y_2O_3$ transparent ceramic and its laser potentialities at cryogenic temperature will be presented.

When: Monday, **1/10/2019 at 14:00**

Where: Seminar room, HiLASE Centre

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