

FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING

## MLL-KOLLOQUIUM

Donnerstag, 23.06.2016, 16<sup>15</sup> Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Dr. Thomas Nubbemeyer**  
(LMU München)

### **Pump laser development for PFS-pro: Thin-Disk Laser Amplifier Systems With High Average Output Power**

The PFS-pro project comprises the development of novel light sources generating ultrashort, ultra-broadband laser pulses with high average power and intensity. These light sources are a vital part of the CALA user facility as frontend systems for attosecond beamlines and Thomson XUV sources.

One of our main research goals is the development of pump laser systems providing hundreds of mJ of pulse energy at repetition rates of 10 to 100 kHz. The key technology employed here is the thin-disk laser principle where the gain medium is a thin Yb:YAG crystal used as an active mirror in our laser systems. Low thermal lensing, low nonlinear effects and efficient cooling, the key benefits from this technology, allow for reaching an average output power of more than 1 kW and high pulse energies simultaneously.

In my talk I will focus on the current status of the PFS-pro project including the most recent results from our thin-disk laser systems. These are our CPA-based (Chirped Pulse Amplification) system with an output pulse energy of up to 200 mJ and the highly compact Direct Femtosecond Amplifier (DFA), delivering 2 mJ / 200 fs pulses at 100 kHz repetition rate without using CPA. Furthermore, I will present a concept of generating even shorter pulses in the range of ca. 20 fs from the output of these laser systems using nonlinear pulse compression techniques.

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