# MASTER THESIS

## *Light-based laser-plasma metrology*

The Centre for Advanced Laser Applications (CALA) at the Forschungszentrum in Garching hosts one of world's most powerful CPA lasers. To support our team in experiments on laser-particle acceleration, we are looking for a talented and motivated

### Master Student

In the framework of your thesis, you will familiarize with operating major parts of particle acceleration experiments that currently aim at optimizing the laser-driven proton source towards first use in biological irradiation experiments.

You will join the operating team of the CALA-LION experiment and build up base knowledge of our devices and methodology. You will design and setup an improved version of a **light-based laser-plasma metrology** that will provide information on the accelerated ion bunch without intercepting it. This **non-invasive diagnostic** will be essential for irradiation studies starting soon. In the scope of your work, you will gain experience with optical and electronic systems, in Python and Matlab programming, data analysis and interpretation. We will support the development of your **presentation skills** and encourage **publication of results**.

Basic knowledge of laser-plasma interactions is beneficial, but not mandatory. Enjoyment of experimental work and great motivation for lab work are major prerequisites.

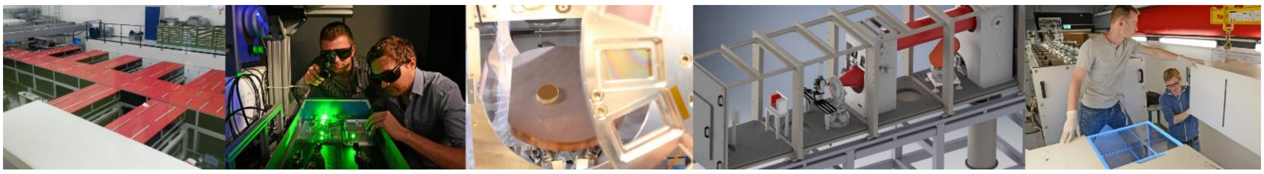
We look forward to your application (transcript of records and CV). You are always welcome to visit us in Garching for a lab tour and a chat in person.

### Laser-driven ION (LION) acceleration

LION acceleration has gained growing interest since its discovery 15 years ago. We use modern ultra-short high-power lasers, applying technology awarded with the 2018 Nobel Prize in Physics. Focusing on solid density targets results in plasma generation and the emission of highly energetic ions. Beams from this source feature unique beam properties that will drive manifold applications in medical physics and basic science.

### Laser-driven plasmas

The laser-target interaction triggers a multitude of non-linear processes that emit electromagnetic radiation. Investigation of this broad spectrum ranging from near-infrared up to x-rays gives insight to the plasma condition during the ultrafast interaction and yields information on the acceleration.




Jens Hartmann, Tel.: 089 289 14172
Jens.Hartmann@physik.lmu.de

Prof. Dr. Jörg Schreiber, Tel.: 089 289 54025
Jörg.Schreiber@lmu.de


www.cala-laser.de