MASTER THESIS

Permanent magnet lenses for ions

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 get familiar with the existing **Permanent Quadrupole Magnets** (PMQ) setup, its alignment procedure and the existing tracking scripts. Building on this knowledge, you will prepare the setup to achieve the smallest possible proton focus on target, by integrating a second PMQ duplet. Achieving a **high particle flux** 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, Matlab and Mathematica 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.

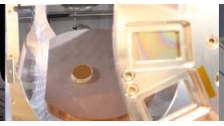
We look forward to your application (transcript of records and CV). You are always welcome to visit us in Garching for a lab tour and a chat in person.

Laser-driven ION (LION) acceleration

LION acceleration has been an emerging research field since its discovery 15 years ago. We use modern ultra-short high-power lasers, applying technology awarded with the 2018 Nobel Prize in Physics. Focused on solid density targets, highly energetic ion are emerging the plasma. Beams from this source feature unique beam properties that will drive manifold applications in medical physics and elsewhere.

Ion beam steering

Today we can find a multiude of different beam steering devices at accelerators. Magnetic fields are perfect to deflect charged particles. High quality permanent magnet quadrupoles (PMQ) can passively supply sufficient fields.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