



## Open post-doctoral position on

### ***Laser plasma studies towards magnetized inertial confinement fusion***

We are looking for a Doctor in Laser-Plasma Physics to work on the planning, numerical design and execution of high-power laser experiments in the context of high energy-density (HED) physics and laser-driven fusion.

**Location:** Centre Lasers Intenses et Applications (CELIA), UMR 5107, Université de Bordeaux, CNRS, CEA, Domaine du Haut Carré, 43 rue Pierre Noailles, Talence (near Bordeaux), France

**Contract type:** full-time fixed-term (12 months)

**Responsible:** Dr. João Jorge Santos

#### **Project synopsis:**

In the framework of Inertial Confinement Fusion (ICF), controlled laser-driven implosions in external magnetic fields (B-fields) is an optional strategy towards higher fusion gains. B-fields induce anisotropic thermal-electron diffusion which may improve the energy confinement on the dense core, therefore increasing implosion efficiency, and even decrease the loss of alpha-particles from the burning region once fusion reactions are initiated. Our project is devoted to the study of physics processes in strongly magnetized plasmas (anisotropic conductivity, non-local heat transport, magnetic flux compression), in particular through magnetized cylindrical implosions at the Omega facility (LLE, Univ. Rochester, USA). For the seed magnetization we will use the platform of optically driving capacitor-coil targets, in which the source of the magnetic field in the coil coupled to a pair of electrodes (the capacitor) is the hot electrons ejection from one of the electrodes upon high-energy and high-intensity laser interaction. The project also schedules preparatory experiments at lower scale European laser facilities with development of new specific diagnostic instrumentation, as well as state-of-the-art magnetohydrodynamics (MHD) and radiation transport calculations.

#### **Purpose of the position:**

The position, funded by CEA, will support the project through numerical simulations (MHD, hydro-radiative) and experiments on large- (Omega-EP, Gekko-LFEX, LMJ-PETAL) and intermediate-scale (LULI2000, PHELIX, Vulcan) laser facilities.

The position will involve a high degree of teamwork and interdisciplinary research. The post holder will daily interact with other academic and research staff at CELIA (experimentalists, theoreticians and numerical physicists), as well as with key external collaborators and the staff of the external high-power laser facilities.

It is expected that the post holder will help producing independent and original research, submit publications to refereed journals and help with the management of the research group.

#### **Requirements:**

- A PhD or be about to obtain a PhD or equivalent level of professional qualifications and experience in the field of plasma physics (essential).
- A strong background in plasma physics, evidencing the ability to carry out original research and to produce scientific research papers (essential).
- Experience in conducting hands-on laboratory experiments with plasmas (desirable).
- Experience operating and developing laser and plasma diagnostics (desirable).
- Experience in designing and developing plasma targetry (desirable).
- Experience in running and interpreting plasma simulations (PIC, hydro-radiative, MHD) (desirable).

#### **Contact and application:**

For expressions of interest please contact Dr. João Jorge Santos at [joao.santos@u-bordeaux.fr](mailto:joao.santos@u-bordeaux.fr). For a formal application please submit a cover letter expressing your motivations, accompanied by detailed CV and list of scientific publications and a list of recommendation contacts.