Postdoctoral position (f/m)
in Beam Dynamics and Simulations

Novel acceleration methods using wakefields excited by high power laser in plasma structure provide very large acceleration gradients, up to 3 orders of magnitude higher than conventional metallic RF structures. This is opening a groundbreaking route to many novel applications like compact X-ray sources for radiography or radiotherapy, compact accelerator for high-energy physics, etc. While laser-plasma accelerators have demonstrated their acceleration capability, further studies are still needed to improve the quality and stability of the accelerated beam in order to make them ready for delivering to user communities. To this end, 16 laboratories and universities from 5 EU member states have brought together to form a European consortium around the project EuPRAXIA (European Plasma Research Accelerator with eXcellence In Applications), in the framework of the EU program for research and innovation "Horizon 2020". EuPRAXIA aims to produce a conceptual design report for the worldwide first plasma-based accelerator facility, capable of delivering beams at 5 GeV with prime quality and reliability, towards two pilot users from high energy physics and photon science.

CEA is strongly involved in EuPRAXIA, especially in physics and simulation, as well as electron beam design and optimization. In order to optimize the various parameters of laser pulse and plasma and to characterize the electron beam properties, numerical simulations are performed by means of dedicated codes in laser plasma acceleration modeling, coupled to particle beam dynamics codes. The electrons must be transported from the source (external RF injector or plasma injector) to the plasma cell in which the electron beam will be accelerated. Manipulation of the beam is particularly challenging because it must be only a few femtoseconds long and a few micrometers large at the entrance of the plasma accelerating structure, while the expected energy spread and divergence at the exit must fit rather constraining user needs.

The post-doctoral position in Beam Dynamics opened at CEA is related to the beam studies in the frame of the European EuPRAXIA project and will focus on the optimization of the electron bunch at the entrance of the plasma structure, and at the transport line towards the users. The selected candidate will:

- contribute to the design of the whole accelerator (plasma structure and transport lines, including magnets specifications)
- perform beam dynamics simulations for the transfer from injector to plasma structure, from plasma structure to the pilot applications
- perform start-to-end simulations, in strong interaction with the team in charge of plasma acceleration simulation
- optimize the transport lines to fulfil the user requirements
- carry out the error studies for the whole accelerator
- participate in the preparation of the technical reports to be delivered
- participate in the technical meetings

The candidate holds a **PhD in accelerator physics** or equivalence. He/She has experience and skills in:

- beam dynamics theory and simulations
- experience in an international scientific project
- technical reporting
- good command of both written and spoken English

The selected candidate will be appointed for 24 months. The position is based at CEA-Saclay, France.

For any **additional information**, please contact Phu Anh Phi Nghiem (phu-anh-phi.nghiem@cea.fr) or Antoine Chancé (antoine.chance@cea.fr).
CV (in PDF format) including a list of publications and cover letter have to be sent to Phu Anh Phi Nghiem (phu-anh-phi.nghiem@cea.fr) and Jérôme Schwindling (jerome.schwindling@cea.fr).