

## Post-doctoral position at the Interactions, Dynamics and Lasers Laboratory (LIDYL) CEA Paris-Saclay, France

### *Attosecond Spectroscopy of Strongly Correlated Materials*

We are looking for a postdoctoral researcher to work on experimental studies of ultrafast dynamics in materials using attosecond spectroscopy. The candidate will conduct attosecond transient absorption and reflectivity experiments, in the framework of two research programs currently pursued in the DICO group:

- 1) ***Light-induced phase transitions in strongly correlated materials.*** This program aims to scrutinize photoinduced Mott transitions, by which a laser pulse can turn an insulating material into a metallic state in only a few femtoseconds. This transition has so far been impossible to study directly in the time domain, as it is faster than the resolution of existing approaches. The candidate will use the time resolution provided by attosecond pulses to study prototypical Mott insulators in order to elucidate electronic dynamics and related correlation-driven phenomena.
- 2) ***Strong-field physics in solids at the scale of the optical cycle.*** Attosecond pulses will be used to probe the initial steps of electronic excitation and relaxation in solids. Focusing on large bandgap dielectrics, the aim is to uncover processes arising in conditions of strong-field driving and high-density excitation: exciton-exciton interactions, impact ionization, bandgap modulation, and multiphoton, tunnel or Zener ionization, to name a few.

**Facilities:** Experiments will mainly be conducted at the ATTOLab-Orme facility hosted by LIDYL at the CEA Paris-Saclay, on a newly commissioned beamline dedicated to attosecond transient absorption, reflectivity and dichroism measurements. The experimental facilities are installed in clean rooms and supplied by a 1 or 10 kHz CEP-stable laser platform. Our team comprises both experts of attosecond sources and of condensed matter spectroscopy, and benefits from the support of experienced laser scientists. In addition, the candidate will benefit from established collaborations with local partners, which grant access to complementary spectroscopic techniques (visible/mid-infrared pump-probe, time-resolved ARPES) and theoretical support.

**What we look for:** Candidates must have a PhD degree (awarded less than 4 years ago) and expertise in experimental time-resolved spectroscopy. Solid skills among the following will be particularly appreciated: condensed matter spectroscopy, attoscience, optics and laser technology, transient absorption/reflectivity, spectroscopy with XUV/X-ray radiation. We will equally consider candidates with a solid-state physics background looking to acquire knowledge in attoscience, or vice-versa.

The candidate should demonstrate scientific creativity, leadership and autonomy. The postdoctoral researcher will be given ample opportunity to gather expertise and exposure, in order to prepare for the next step of their scientific career. They will be encouraged to lead projects, mentor students, participate in proposal writings and pursue new personal research directions.

***The available position is fully funded for two years (24 months), starting not before October 1<sup>st</sup> 2021, and will remain open until a suitable candidate is found.***

**How to apply:** Interested candidates should send a CV, a list of publications, a cover letter summarizing expertise and research interests, and arrange for at least two letters of recommendation.

Contacts: [romain.geneaux@cea.fr](mailto:romain.geneaux@cea.fr) and [stephane.guizard@cea.fr](mailto:stephane.guizard@cea.fr).

Questions prior to formal applications are welcomed as well.