Post-doctoral position in ultrafast spectroscopy of molecular photoswitches and photoactive metal complexes

Processes such as charge transfer or light emission involve excited states that often occur in the nanosecond to microsecond range. However, the nature and lifetimes of photophysical processes in many photoactive systems are the result of the close interplay of a series of more short-lived electronic states, from femtosecond to picosecond time scales. The understanding of the excited state dynamics and the chemical structure/photophysical properties relationships in these systems is of paramount importance to develop highly efficient photoactive systems. In this regard, transient absorption spectroscopic (TAS) techniques provide powerful tools to study the fundamental chemical physics behind such processes.

One of the main projects of our laboratory (L2CM, Nancy, France) aims at the design of photoactive organic molecules and metal complexes or applications in photomedicine or photovoltaics. In this context, applications are opened for a postdoctoral fellowship position funded by the European FEDER project entitled **"FireLight**: **Photoactive molecules and nanoparticles"** to investigate the ultrafast excited state dynamics of these photoactive systems. More specifically, the research program will focus on (1) the investigation of ultrafast photochemical processes behind Z/E photoisomerization of bioinspired molecular photoswitches and (2) the determination of the excited state properties of photoactive metal complexes.
The transient absorption experiments will be driven by a fully integrative TAS commercial setup (Light Conversion) composed of a Ytterbium laser (Pharos), an optical parametric amplifier (OPA Orpheus Gapless) which generates pump pulses for sample excitation (<100 fs pulse duration) in the Vis-NIR region (650-1300 nm). The lower UV-Vis part (325-650 nm) is generated from a Second-Harmonic generator (SH-Lyra). The broadband probe supercontinuum is generated from Sapphire crystal to span a 350 – 1100 nm spectral region. The excitation pulse energy and repetition rates are tunable (from tens to 30 µJ, 1-60 kHz), and the spectrometer (Harpia) is equipped with a delay line of 8 ns.

Skills/Qualifications

Candidates for this postdoctoral fellowship must hold a PhD degree in physics or chemistry, with strong expertise in transient absorption spectroscopy. Creativity, autonomy and strong reliability are highly required. All applicants must be able to communicate fluently in French and/or English (speaking and writing). The position is available for a period of 12 months, starting from September 2022.

Selection process

Interested candidates should send a CV, a scientific track record, a motivation letter and two recommendation letters to: Dr. Yann Bernhard, Dr. Katalin Selmeczi

Contact: yann.bernhard@univ-lorraine.fr ; katalin.selmeczi@univ-lorraine.fr