



Postdoctoral Position in Guided Optics

Guided optics is undergoing significant development in the mid-infrared region, where it opens up new prospects for the development of photonic devices for spectroscopy, sensing, or imaging. Waveguide dispersion is an essential property, particularly for controlling the propagation of ultrashort pulses and the resulting nonlinear processes. In particular, it plays a decisive role in spectral continuum generation, whose dynamics and spectral bandwidth depend heavily on the position of zero-dispersion wavelengths and higher-order dispersion terms. Therefore, measuring dispersion constitutes an essential step in establishing the link between waveguide properties and their performance in generating broadband sources in the mid-infrared.

At the Laboratoire de Physico-Chimie de l'Atmosphère, we develop optical waveguides using ultrashort pulse laser photo-writing in chalcogenide glasses. These materials are of particular interest for mid-infrared applications due to their broad spectral transparency window and strong nonlinear optical properties. The implemented photo-writing process allows the fabrication of waveguides with very low propagation losses, on the order of 0.1 dB/cm, while offering precise control of their linear guiding properties.

The proposed mission aims to develop an experimental method to accurately measure the dispersion of waveguides fabricated in the laboratory. The postdoctoral researcher will be responsible for designing, setting up, and validating the experimental setup dedicated to this characterization, and then using it to study the influence of various photo-writing parameters on the dispersive properties of the waveguides. This work will make it possible to establish relationships between writing conditions, linear guiding properties, and the dispersion of the obtained structures. A final part of the project will consist in relying on these results to design and fabricate novel waveguide architectures enabling dispersion engineering to achieve the desired dispersive properties. The overall goal will thus be to develop an integrated approach, from waveguide fabrication to dispersion control, in order to optimize their performance for mid-infrared continuum generation.

Start date: January 1, 2027

Duration: 12 months

Indicative gross monthly salary: Starting from €2,500, depending on experience

Laboratory: Laboratoire de Physico-Chimie de l'Atmosphère

Institution: Université du Littoral-Côte d'Opale

Address: 189A Avenue Maurice Schumann, 59140 Dunkirk, France

Contact: Prof. Pascal Masselin (pascal.masselin@univ-littoral.fr)

Application:

Applications, consisting of a curriculum vitae, a cover letter, and optionally recommendation letters, should be sent directly to Pascal Masselin.