

## Call for one-year postdoctoral position (2021-2022) in TeraHertz gas phase spectroscopy

### *Development of a mm-wave ultra-sensitive spectrometer for the gas phase detection of explosive taggants*

<b>Keywords</b>	Rotational spectroscopy, millimeter-wave spectroscopy, resonant cavity, explosive taggants.
<b>Projet</b>	<p>The project is the initial part of the LPCA activity in an ANR ASTRID project untitled: METIS « <i>Millimeter-wave Explosive Taggant vapors Investigations using Spectral taxonomy</i> ».</p> <p>The main objective of this project is to provide a new approach for the detection and the discrimination of explosive taggants in gas phase. In this context, the development of an ultra-sensitive mm-wave absorption spectroscopy technique is required. Our group has recently adapted the intra-cavity techniques developed in the IR domain to the longer wavelengths of the THz/submm-wave spectral domains. Using Fabry-Perot THz absorption spectroscopy, we were able to perform gas phase measurements with an equivalent path-length longer than 1 km in the 620 GHz frequency range. For the METIS project, the postdoctoral fellow will adapt this setup in a lower frequency range (70-150 GHz) by the association of the skills of the THz LPCA group in Dunkirk and the microwave group of the PhLAM laboratory in Lille. The performances of the developed setup will be evaluated by the measurements of the most volatile explosive taggants such as mono-nitrotoluenes at trace level.</p>
<b>Qualifications</b>	<p>The candidate should have a PhD in molecular spectroscopy and/or in the development of optoelectronic instrumentation for spectroscopic applications. He/she should have expertise in one or more of the following fields: high-resolution spectroscopy analysis, THz instrumentation, spectroscopy in a resonant cavity. In addition to instrumental development skills, an experience in the measurement and in the analysis of high-resolution spectra will be appreciated.</p> <p>Expectations from a postdoctoral researcher:</p> <ul style="list-style-type: none"> <li>- Perform research on the assigned topics in collaboration with colleagues.</li> <li>- Write progress reports, write and publish research articles in international journals.</li> <li>- Present the work in conferences/meetings.</li> </ul> <p><b>Since ASTRID project are coordinated both by the French ANR and the DIA (Defense Innovation Agency), only PhD students from the European Union, the United Kingdom or Switzerland are eligible.</b></p>
<b>Application</b>	Candidates are invited to send their application by email, including a statement of research activities, a cover letter, a CV, as well as name and address of two referees who could write a recommendation letter.
<b>Salary</b>	Around 2133€ free of charges
<b>Dates</b>	The candidate should be available for starting on September 1 <sup>st</sup> 2021 to the August 31 <sup>st</sup> 2022. A 6-month contract extension may be considered if necessary.
<b>Laboratory location</b>	Laboratory for Physico-Chemistry of the Atmosphere (LPCA) Université du Littoral-Côte d'Opale (ULCO) 189A, avenue Maurice Schumann, 59140 Dunkerque, France
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