

## Three-Year PhD Position in Chemical Kinetics at the Institute of Physics of Rennes (IPR), France

A PhD fellowship, funded by the French National Research Agency (ANR) under the OXIBIO3 project, is available for a duration of three years. The position is expected to begin on 1st October 2025 and will be based at the Institute of Physics of Rennes (IPR), located in the west of France, approximately 1.5 hours by train from Paris.

The successful candidate will join the Molecular Physics Department at IPR, which comprises 24 permanent members and 20 PhD students and postdoctoral researchers. The department is divided between theoretical and experimental research, with applications in laboratory astrophysics, atmospheric physical chemistry, and combustion.

### About the OXIBIO3 Project

The OXIBIO3 project aims to combine advanced optical spectroscopy, mass spectrometry, and gas chromatography to characterize, detect, and quantify—under combustion-relevant temperatures and in real-time—reaction products, including reactive intermediates, from ozone-initiated oxidation of biomass-derived molecules. These molecules serve as biofuel surrogates. The ultimate goal is to develop detailed kinetic models for these chemical systems, which will be made available to academic and industrial institutions. These models will facilitate the integration of relevant chemistry into CFD simulations, contributing to the design of more economical and environmentally friendly combustion processes.

### Responsibilities

The PhD candidate will be based at IPR and will undertake the following tasks, linked to the development and use of a new experimental apparatus:

- Take a leading role in the development of a flow tube experimental setup designed to replicate gas-phase oxidation reactions initiated by ozone under conditions resembling atmospheric and combustion environments.
- Integrate this setup with chromatographic and mass spectrometry tools to detect, identify, and quantify as many reaction products as possible.

### Candidate Profile

The ideal candidate should meet the following requirements:

- Hold a Master's degree or equivalent in Combustion Chemistry, Atmospheric Chemistry, Gas-Phase Physical Chemistry, or a closely related field.
- Possess a strong background in either gas-phase chemical kinetics, molecular dynamics, or atmospheric/combustion chemical reactivity.
- Have hands-on experience with at least one of the following: proton-transfer mass spectrometry (preferred) or gas chromatography
- Familiarity with quantum chemistry software (e.g., Gaussian, Molpro) and/or kinetic modeling would be highly valued.
- Fluency in spoken and written English is required; knowledge of French is not mandatory.
- Demonstrate the ability to disseminate research results through publications and presentations at scientific conferences.

## Application Process

Applications should include:

- A cover letter detailing the candidate's motivation and suitability for the position.
- A CV.

Applications should be sent via email to:

- **Jérémy Bourgalais** (jeremy.bourgalais@cnrs.fr)
- **Robert Georges** (robert.georges@univ-rennes.fr)

Interviews will be conducted on a rolling basis until the position is filled. The start date is non-negotiable.

## Salary and Additional Information

The gross monthly salary will be €2,200. For more information about the research team and activities, please visit the IPR website: <https://ipr.univ-rennes.fr/en/molecular-physics-department>

Please forward this opportunity to any suitable candidate.

With kind regards,  
Jérémy Bourgalais