



Postdoctoral Research Position (24 months) Photocatalysis for Biomass Valorisation

The *Laboratoire Lorrain de Chimie Moléculaire* (L2CM, UMR CNRS 7053), located in Nancy, France, invites applications for a **24-month postdoctoral position** starting **April 1st, 2026**, within the framework of the **PEPR B-BEST** French national research program.

Scientific Context

The transition toward sustainable chemical manufacturing requires innovative strategies to replace fossil-based processes with biomass-derived alternatives. Among key platform molecules, 5-hydroxymethylfurfural (5-HMF) offers exceptional potential for the production of bio-based polymers, fuels, and fine chemicals. However, conventional catalytic oxidation routes remain energy-intensive and poorly selective.

The **GQD-BIOCAT project** proposes an original and integrated approach to 5-HMF valorization by combining **photocatalysis and biocatalysis** in a single modular reactor. The project focuses on the development of **multi-catalytic hybrid materials (MCHMs)**, in which photocatalysts and enzymes will be co-immobilized on a common support.

Research Objectives

The recruited postdoctoral researcher will contribute mainly to:

- The design, synthesis and characterization of finely tuned **graphene quantum dots (GQDs)** and/or **GQDs hybrid materials** as visible-light-active photocatalysts.
- The selective photocatalytic oxidation of 5-HMF into key intermediates such as **FDCA** and **DFF**.

And to a lesser extent to:

- The development of **hybrid photo–bio catalytic systems**
- The study of structure–activity relationships and system integration challenges in coupled photo- and biocatalysis

Candidate Profile

Applicants should hold a PhD in **chemistry, materials science, or a related field**, with a strong background in **photocatalysis and (nano)materials chemistry**. Good knowledge of English and scientific communication skills, oral and written skills. Sense of thoroughness, organization and initiative; capacity of synthesis; reactivity and autonomy.

Application

Interested candidates should send their application **by email**, including:

- A curriculum vitae
- A brief cover letter describing research interests and relevant experience
- Contact information for references

Application deadline: 20/02/2026

Expected starting date: 01/04/2026

For informal inquiries or applications, please contact the project coordinator, Philippe PIERRAT, philippe.pierrat@univ-lorraine.fr.