

Postdoctoral Research Position in Hydrology and Biogeochemistry Geosciences Rennes (University of Rennes, France)

Application deadline: 28 February 2026

Start date: 1 April 2026

Duration: 2 years full time

Location: Geosciences Rennes, University of Rennes, France

About the Position

Geosciences Rennes (University of Rennes – France) invites applications for a full-time postdoctoral fellowship in Hydrology and Biogeochemistry. The successful candidate will join the research team of the CarboNium project, funded by the French National Research Agency through the FairCarbon program (<https://www.pepr-faircarbon.fr/eng/faircarbon>).

The CarboNium project aims to improve our understanding of the carbon cycle along the land-ocean continuum, integrating inland and coastal aquatic ecosystems, estuaries and river systems. A major uncertainty in global carbon budgets and greenhouse gas emission estimates arises from limited knowledge of inland water carbon fluxes. CarboNium addresses this gap by developing new analytical and modeling tools to quantify carbon fluxes - organic, inorganic and dissolved gaz- at the scale of France. The project combines extensive monthly carbon monitoring across French Research Infrastructure Observatories with high-frequency measurements at dedicated sites. **The postdoctoral researcher will contribute to this effort by focusing on high-frequency carbon measurements in streams, helping to reveal the spatial and temporal dynamics of greenhouse gas emissions along river networks.**

Research objectives and missions

The postdoctoral researcher will design and lead innovative field installations for the continuous measurement of CO₂ and CH₄ concentrations in streams, along with the quantification of stream degassing. This work will help fill the current gap in long-term, high-frequency CO₂ and CH₄ time series in river systems. Using these new datasets, she/he will investigate where, when, how much and why CO₂ and CH₄ are emitted within stream networks and relate their temporal dynamics to external and internal drivers. One key challenge is to distinguish between CO₂ and CH₄ fluxes driven by lateral groundwater inputs (external factors) and those from in-stream metabolism (internal factors), two processes with distinct dynamics and sensitivities to climate change. Another component of the project will focus on scaling up observations from individual catchments to larger spatial scales. This will involve regional field campaigns and the development of statistical approaches for upscaling, with the ultimate goal of predicting stream GHG emissions across the region.

Research sites

The work will focus on two sites that are part of the French Critical Zone Research Infrastructure (OZCAR). The Guidel site (Southern Brittany) is a small headwater catchment characterized by significant groundwater discharge with strong implications for carbon cycling. The Orgeval site (Seine Basin) is a larger catchment where in-stream metabolism occurs, potentially moderated by high carbonate buffering. The project will also include regional field campaigns across multiple streams to assess spatial variability

in CO₂ and CH₄ concentrations and fluxes. These regional datasets will provide the basis for scaling up emissions to broader scales. The precise instrumental setup and interpretation frameworks may evolve based on the applicant's expertise and research interests.

Main activities

- Conducting intensive fieldwork at Guidel and regional field campaigns, with support from the Geosciences Rennes field technical team: a) Installing, maintaining and performing quality control on high-frequency dissolved gas instruments; b) Field tracer test experiments to quantify stream degassing. The fieldwork at Orgeval will be conducted by the local team.
- Leading data interpretation and developing adequate post-processing methods for high-frequency datasets.
- Identifying temporal patterns and environmental drivers of CO₂ and CH₄ fluxes.
- Publishing research findings in high-impact international journals.

Profile and skills requirements

- PhD in Earth Sciences, more specifically in ecohydrology, hydrogeology or (bio)geochemistry
- Autonomy and strong motivation to develop and deploy new field-instrumentation
- Experience in data analysis and modeling, particularly with high-frequency environmental datasets
- Teamwork and organisational skills, rigor, adaptability, and openness to interdisciplinary collaboration.

Hosting structure

The successful candidate will join Geosciences Rennes in the Department of Environmental Sciences (OSERen), one of Europe's leading laboratories for water research. The institute offers a stimulating and supportive environment for interdisciplinary research, with strong connections to national and international networks. In addition, the Condate-Eau platform which is an analytical laboratory at Geosciences Rennes dedicated to the measurement of dissolved gases, will ensure excellent technical and logistical support. As the position is embedded within the national CarboNium project and closely linked to Critical Zone observatories, the researcher will also benefit from dynamic collaborations and vibrant research communities across multiple institutions. The postdoctoral researcher will be supervised by Camille Bouchez and Eliot Chatton (Univ. Rennes), Sophie Guillon (Sorbonne Univ.) and Clément Duvert (CEREGE).

Gross monthly salary: €2,700 - €3,300 depending on experience. Coverage of health insurance.

Application instructions

To apply, please send to Camille.bouchez@univ-rennes.fr ; Eliot.chatton@univ-rennes.fr ; sophie.guillon@minesparis.psl.eu ; clem.duvert@cdu.edu.au :

- a CV including list of publications
- a recommendation letter
- a cover letter describing your research interests, motivations and relevant experience