

Job description

Postdoctoral position in ocean colour remote sensing, plankton biodiversity and machine learning

18-month postdoctoral position in marine remote sensing, plankton biodiversity, and artificial intelligence

Laboratoire d'Océanologie et de Géosciences (LOG UMR 8187), Wimereux - Université du Littoral Côte d'Opale

Context

Marine plankton biodiversity is extraordinarily complex, dynamic, and structured across multiple spatial and temporal scales. It plays a central role in ocean ecosystem functioning, biogeochemical cycles, and climate regulation, yet it remains difficult to characterize and monitor at large scales. Over the last decade, omics approaches have profoundly transformed our ability to describe plankton communities in situ, revealing levels of diversity and ecological organization that were previously inaccessible. At the same time, the emergence of new hyperspectral satellite missions, together with multispectral ocean-colour observations, is opening promising opportunities to investigate whether part of this biological complexity can be detected from space through optical signatures.

Position objectives

The position is part of PlanktoSpace, an international research project funded by the European Space Agency (ESA) and dedicated to developing new approaches for observing plankton biodiversity from space. The postdoctoral researcher will contribute to the development, evaluation, and scientific exploitation of methods designed to link satellite ocean colour observations with in-situ plankton biodiversity data. The work will focus on implementing statistical and machine learning approaches adapted to multi-source datasets, analysing spectral signatures associated with the biological structure of plankton communities, and validating and scientifically interpreting the resulting products.

Main duties

The successful candidate will contribute to the construction and exploitation of matchup datasets linking in situ and satellite observations, to the development of algorithms tailored to different sensors, to the evaluation of their performance, and to the quantification of associated uncertainties. He or she will also contribute to the generation of experimental satellite products describing proxies of plankton biodiversity, and to their scientific analysis across different spatial scales. The position will also include active participation in the scientific dissemination of the project through the writing of papers, reports, and presentations, in close interaction with the consortium partners.

Profile

The position is open to candidates holding a PhD in oceanography, remote sensing, marine sciences, biostatistics, data science, signal processing, machine learning, or a related field.

Experience in environmental data analysis, scientific programming, and statistical or machine learning methods is expected. A strong interest in ocean colour, marine biodiversity, and interdisciplinary research will be particularly appreciated.

PlanktoSpace

Genomic methods applied to plankton have profoundly improved our ability to describe marine biodiversity, but existing in situ datasets remain too heterogeneous and too limited in number to be robustly linked to hyperspectral satellite observations. PlanktoSpace therefore aims to build, at the global scale, a coherent dataset matching in situ measurements of plankton biodiversity (metabarcoding) with satellite-derived ocean-colour observations, in order to develop new algorithms capable of estimating proxies of biodiversity and plankton community structure from spectral signatures. The project relies in particular on hyperspectral data from PACE and on multispectral observations from Sentinel-2, Sentinel-3, and OC-CCI. PlanktoSpace is built around a multidisciplinary consortium bringing together several complementary partners. Plymouth Marine Laboratory provides strong expertise in Earth observation. Sorbonne Université / Station Biologique de Roscoff contributes expertise in plankton biodiversity, ecology, omics, and bioinformatics. Seatizens for Plankton Planet (S4P2) is responsible for the participatory science component at sea and for coordinating data collection from vessels of opportunity. ULCO, through LOG in Wimereux, contributes expertise in marine remote sensing, statistical learning, and artificial intelligence applied to ocean ecosystems.

Working environment

The position will be based at LOG in Wimereux, within an interdisciplinary laboratory in marine sciences and geosciences, with expertise in ocean remote sensing and machine learning for marine environments. The postdoctoral researcher will work in a collaborative setting, in close connection with an international consortium combining expertise in Earth observation and plankton biodiversity.

Indicative gross monthly salary: between €2,500 and €3,716.70 gross/month, depending on the candidate's professional experience, in accordance with the ULCO salary scale applicable to postdoctoral contracts.

How to apply

Send your application (CV and description of latest research activities and aims) to roy.elhourany@univ-littoral.fr