Post-doctoral fellow / research engineer - Planktonic blooming taxa and turbulence

Location: Laboratory of Oceanography and Geosciences (LOG) - UMR, 8187, Wimereux, France. http: //log.cnrs.fr
Duration: 12 months (with possible 2 months extension).
Contacts: *urania.christaki@univ-littoral.fr* and *francois.schmitt@cnrs.fr*

Application Deadline: 20/11/20 or until the suitable candidate is recruited.

Start of contract: 1 January 2021

Salary: net salary ~ 2000 Euros / month
This project is funded by the University du Littoral Côte d'Opale and the CPER MARCO.

Context and objectives of the project: The eastern English Channel is a coastal system characterized by strong blooms of *Phaeocystis globosa*. However, this ecological succession is also marked by other opportunistic planktonic taxa which proliferate momentarily. These organisms belong to different functional groups (see different phylogenetic groups or domains of life) such as heterotrophic bacteria, heterotrophic microbial eukaryotes, and phytoplankton, parasites. All these organisms have small sizes and high growth rates in common. Within the framework of this project, the dominant planktonic organisms will be a) diatoms, and b) heterotrophic bacteria.

This post-doctoral project will have two parts: An experimental part which will focus on the effect of turbulence on the proliferation and toxicity of diatoms of the genus *Pseudo-nitzschia*, and an analysis part of in situ observation time-series and metabarcoding data.

Experimental part: The strong turbulence and abundant nutrients in the eastern English channel and the North Sea favor the success of diatoms, which can reach concentrations of the order of several million cells per liter of water. The aim here, is to explore for the first time the effect of this turbulence on the proliferation of cosmopolitan and potentially toxic diatoms of the genus *Pseudo-nitzschia*. The post-doctoral fellow will be responsible for setting up, maintaining the culture, and complete short-term experiments in the devices generating turbulence; a prototype of which is already available at LOG. Five levels of turbulence will be considered: (i) No turbulence - the control, or representative of a "stationary state"; (ii) Low rotation - representative of low turbulence rate; (iii) Medium rotation - representative of the marine environment in calm period; (iv) Fast rotation - representative of the turbulent marine environment; and (v) Very fast rotation - representative of storms. The planned analyzes aim to determine: (i) the rate of growth and formation of colonies as a function of the level of turbulence by counting in microscopy; (ii) the effect on the morphology of cells due to electron microscopy; (iii) the concentration of dissolved and particulate domoic-acid by spectro-fluorimetry; and (iv) the differential expression of genes in the absence and in the presence of turbulence (provided by external collaborators but the post-doctoral researcher will have access to the data and possibly participate in publications).

Observation data analysis: The objective of this component is to analyse an *in situ* observation time series. We have a coastal plankton observation time series of about 25 years (1996-2020) acquired by the national observatory (SNO SOMLIT-Wimereux) by microscopy. This dataset is completed by a five-year series (2015-2020) with periods of high sampling frequency on a network of five coastal stations in microscopy and metarbarcoding (prokaryotes, eukaryotes). At the same time, a set of data of ten environmental variables is also available. The post-doc will focus on the analysis of data of bacterial and phytoplankton diversity and their biotic and abiotic interactions, with a focus on turbulence forcing.

Required Skills

- Knowledge in ecology, plankton ecology, and succession in planktonic communities.
- Culture of phytoplankton. Autonomy and spirit of initiative to set up the experimental device.
- Solid knowledge and experience in analyzing large datasets in an ecological context (use of functional traits, niche analyzes, and interaction networks, etc.).
- A good experience in using programming software such as R or MATLAB.
- A good level of English and writing skills (essential).

Recruitment procedure

The application file should be sent by email to: *urania.christaki@univ-littoral.fr* and *francois.schmitt@cnrs.fr*. Indicate as the subject of the email: *Post-doctoral application*.

The application should include:

- Your curriculum vitae / resume.
- A short letter of motivation explaining your motivation and competences for this post-doc.
- The names of two referees.