![Institut des sciences du calcul et des données - SORBONNE UNIVERSITÉ]

Job Offer

Job Summary

Title, Job Position	**Post doc in ecological modelling on the representation of zooplankton diversity in marine biogeochemical models**
Research Field	Modelling, Ecology, Biogeochemistry, Data assimilation
Employer	Sorbonne Université, Institut des sciences du calcul et des données
Location:	LOCEAN/IPSL, Paris, France
Application Deadline / Timezone	31-10-2021 11:00AM Paris (GMT+01 :00)
Salary	Depending on skills and experience (Gross salary about 2514€/month without experience)
Type of Contract	Temporary (fixed term) 12 months (with potential extension)
Job Status	Full-time
Envisaged Starting Date	01-01-2022

Hiring Organization

Organisation

Sorbonne Université (SU) was created on January 1st, 2018 from the merger of Paris-Sorbonne and Pierre and Marie Curie (UPMC) universities. As a public institution, it fulfills the public service calling of French higher education, research and innovation. SU is a multidisciplinary and research-intensive university with world-famous origins. The University's 53,500 students, 3,400 professor-researchers and 3,600 administrative and technical staff members who help it run every day contribute to a University that is diverse, creative, innovative, and with a global outlook.

Organisation Type

Higher Education Institute

Departments

Institut des sciences du calcul et des données, FED 3

The **Institute of Computing and Data Sciences** (ISCD; http://iscd.sorbonne-universite.fr/) is dedicated to exploring and developing the potential of computational and data-driven research and training across science, humanities and medicine at Sorbonne Université. Our research teams use the power of algorithms and visualization to solve problems in biology, mathematics, computer science, chemistry, medicine, and the digital humanities. The ISCD hosts the FORMAL junior team gathering oceanographers, mathematicians, and computer scientists, to study the dynamics of life in the ocean (http://iscd.sorbonne-universite.fr/research/sponsored-junior-teams/formal-2/)

Laboratoire d'Océanographie et du Climat : Expérimentations et Approches Numériques (LOCEAN/IPSL)

The LOCEAN laboratory (https://locean-ipsl.upmc.fr) is one of the nine laboratories in the Paris region in environmental and climate sciences of the Institut Pierre-Simon Laplace (IPSL) (https://www.ipsl.fr). The activity of the host team at LOCEAN (PROTEO) aims at a better understanding of the fine-scale interactions between ocean physics, marine biogeochemistry and marine ecosystems. The team gathers marine ecologist, biogeochemists, and physical oceanographers and uses a combination of numerical methods (coupled bio-physical models, data assimilation) and ocean data (satellite, in situ survey).

Offer Description

Description

The post-doc will be recruited by ISCD/FORMAL at the LOCEAN to improve the representation of zooplankton diversity and dynamics in biogeochemical models. More specifically, she/he will use available data (incl. omics and imaging data) to **develop and calibrate a Plankton Functional Type (PFT) model** within the NEMO-PISCES framework. Data collected at several time-series stations (e.g., DYFAMED and Point-B in the Med Sea, BATS in North Atlantic) and during oceanography cruise (e.g. UVP data at global scale) will be used to define zooplankton functional groups that will be implemented in the model. Special attention will be given to the representation of key functional traits of zooplankton, like size and trophic regime. The model will be parameterized using state-of-the art methods, such as microgenetic algorithms, and error estimates will be produced for the various model configurations. The main goal of this position is to improve the representation of zooplankton diversity in biogeochemical models in order to shed a new light on zooplankton diversity and its impact on biogeochemical cycles. Ultimately, such work should improve our ability to predict the impact of climate on marine systems. Depending on the candidate profile, further developments could be proposed for data assimilation or ecological modelling.

The post-doc will work in close interactions with the marine ecologists and biogeochemists of the FORMAL team in Paris and in the marine stations of Sorbonne University, and will also benefit from interactions with other oceanographers from IPSL, data scientists from ISCD, and mathematicians from LJLL. International collaborations (e.g., Univ. Laval in Canada, Univ. of Bristol in the UK, BIOS in Bermuda) will also be encouraged and the post-doc will benefit from our large network of collaborators in Europe and beyond.

Faculty sponsors

Sakina-Dorothée Ayata, sakina-dorothee.ayata@sorbonne-universite.fr, http://www.normalesup.org/~ayata/

Marina Lévy, marina@locean-ipsl.fr

Appointment Term

One-year appointment from January to December 2022, or as soon as possible with the possibility of a further extension in 2023 based on performance and available funding.

Keywords: *PFT model, zooplankton, data assimilation, biogeochemical model, diversity*

Related bibliography (not exhaustive)

Aumont, O., Ethé, C., Tagliabue, A., Bopp, L., and Gehlen, M.: PISCES-v2: an ocean biogeochemical model for carbon and ecosystem studies (2015) Geosci. Model Dev., 8:2465–2513, https://doi.org/10.5194/gmd-8-2465-2015

Ayata SD, Lévy M, Aumont O, Sciandra A, Sainte-Marie J, Tagliabue A, Bernard O (2013) Phytoplankton growth formulation in marine ecosystem models :should we take into account photo-acclimation and variable stoichiometry in oligotrophic areas ? Journal of Marine Systems 125:29-40

Benedetti F, Gasparini S, Ayata SD (2016) Identifying copepod functional groups from species functional traits. Journal of Plankton Research 38(1):159-166

Mayersohn B, Smith KS, Mangolte I, Lévy M (2021) Intrinsic timescales of variability in a marine plankton model. Ecological Modelling, 443, 109446

Profile Requirements

Required Education Level

Expertise in biogeochemical et ecological modelling.

Skills / Qualifications

- Applicants **must hold or be close to completion a Ph.D**. or have at least 3 years of experience since his/her engineering degree in Marine biogeochemistry, Ecology, or Applied Mathematics.
- Proficiency in **numerical modelling**, using FORTRAN, Python, R, C, or MATLAB.
- Applicants should have **excellent writing and communication skills** necessary to write technical and scientific reports, publications, and deliver scientific presentations, seminars, meetings and/or teaching lectures to a non-specialist audience. At least one publication in a relevant field as first author would be a plus.

- Experience **collaborating effectively with a team of scientists of diverse backgrounds**, and communication skills to closely interact with an interdisciplinary team (including computer scientists, biologists and oceanographers).

Specific Requirements
- This position involves a significant amount of computer code development. Therefore, the candidate will have prior scientific programming experience (as mentioned above) but also a certain enthusiasm for coding.

Required Languages

Scientific & technical English (B2 level for written and oral). French would be a plus, but not mandatory.

Required Research Experience

No experience after the completion of the latest appropriate degree is required.

Work Location

Institutes

Institut des sciences du calcul et des données. Project-Team FORMAL.

Laboratoire d'Océanographie et du Climat : Expérimentations et Approches Numériques (LOCEAN/IPSL)

Country: France

Location: LOCEAN, 4 place Jussieu, 75005 Paris

How to apply?

Required Application Materials
1. Cover letter with current and future research interests
2. Most recent curriculum vitae
3. Copy of first author publications
4. Names and contact for three referees

How to submit

Interested candidates should:
- Contact for additional information about the offer (Sakina-Dorothée Ayata and Marina Lévy)
- Submit the required application materials to: Pascal Frey ISCD (iscd@sorbonne-universite.fr), with the title "ISCD Fellowship Application - FORMAL LOCEAN"

Selection Procedure

Selection process

The Institute's selection process is based on an email submission. Candidates are evaluated by faculty reviewers, both in their own academic fields and from other disciplines. Reviewers will evaluate candidates according to their academic accomplishments and their potential for research.

The selection process is organized in four stages.
1. Eligibility check: candidate's compliance with the requirements of the offer will be checked on the basis of the information provided by the applicant.
2. Evaluation of CV: applicant's CV and research proposals will be evaluated and ranked according to their merit.
3. Interviews of candidates: **short listed** candidates will be invited for an interview conducted by the selection committee.
4. Final decision: the selected candidate will be proposed the position. A reserve list of candidates may be identified in case of withdrawal of the selected candidate.

Please note that priority in individual applicant selection will be given to first-time fellows.