

3-YEAR POSTDOC POSITION IN EXPERIMENTAL FLUID MECHANICS

HOW DO COPEPODS REACT TO A TURBULENT FLOW?

RESEARCH FIELDS

ENGINEERING, NATURAL SCIENCES

LAB

IRPHE, MARSEILLE, FRANCE

FUNDING

EUROPEAN RESEARCH COUNCIL, ERC ADVANCED GRANT, PROJECT COPEP0D

POSTDOC SALARY

GROSS ANNUAL SALARY BETWEEN 28,000€ AND 45,000€, DEPENDING ON EXPERIENCE

CONTACTS

CHRISTOPHE ELOY (CHRISTOPHE.ELOY@CENTRALE-MARSEILLE.FR & WWW.IRPHE.FR/~ELOY)

GAUTIER VERHILLE (GAUTIER.VERHILLE@IRPHE.UNIV-MRS.FR & WWW.IRPHE.FR/~VERHILLE)

Context. Copepods are millimetric crustaceans that live in all seas and oceans. Copepods are blind, yet they are able to detect preys, predators and mates by using highly-developed hydrodynamic and chemical sensing. How do they extract a meaningful signal from turbulence noise? How do they react to this information? Today, we do not know.

Objectives. The objective of the project is to link the flow information sensed by copepods to their motor behavior. For this purpose, we will track copepods in different flows. The experiments will be performed in simple model flows (shear flow, Taylor-Green vortices), as well as in a turbulent flow (von Karman flow). The challenge is to infer, from 3D tracking data, a behavioral relationship between the local flow sensed by the animal and its action. This behavior will be compared to what is expected from a copepod model trying to catch a prey or escape a predator.

Profiles. Candidates should hold a PhD in fluid mechanics, soft matter, or biophysics, and have an outstanding track-record. Candidates with a taste for interdisciplinary research will receive a particular attention.

Environment. The 'Institut de recherche sur les phénomènes hors équilibre' (IRPHE) is located in Marseille, France. IRPHE is one of the leading French laboratories in fluid mechanics, with a strong interdisciplinary history. The candidates will join the international research group of Christophe Eloy as postdoctoral scholars. They will contribute to the ERC-funded project COPEP0D.

Applications. Candidates are invited to contact Christophe Eloy and Gautier Verhille by email before October 15th, 2021 for a starting date not before 2022. They should provide: (1) a detailed CV with a publication list, (2) contact information of at least 2 academic references, and (3) a 2-page research statement describing past activities and research interests.

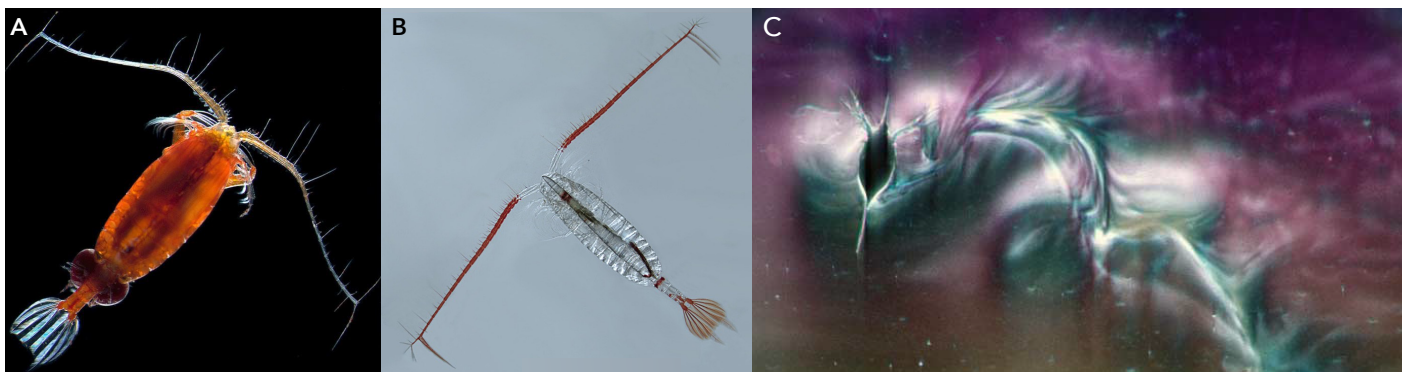


Figure. Two pictures of planktonic copepods: (A) *Valdiviella insignis*, a 9 mm long copepod living around Ireland and (B) *Calanus hyperboreus*, a 10 mm long copepod living in the Arctic. Both have long antennae covered with sensing hairs that allow them to sense flow velocities and chemical concentrations (Photo credits: Russ Hopcroft/Census of Marine Life). (C) Schlieren visualisation of a swimming copepod *Daphnia lumholtzi* (from Strickler & Balazsi, 2007).