Centrale Marseille

European Research Council
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IRPHE

3-YEAR POSTDOC POSITION IN BIOLOGICAL FLUID DYNAMICS

HOW DO COPEPODS REACT TO A TURBULENT FLOW?

RESEARCH FIELDS

ENGINEERING, NATURAL SCIENCES, COMPUTER SCIENCES

LAB

IRPHE, MARSEILLE, FRANCE

FUNDING

EUROPEAN RESEARCH COUNCIL, ERC ADVANCED GRANT, PROJECT C0PEP0D

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 copepods exploit this sensing information? 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 dynamics, applied mathematics, 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 one aspect of the ERC-funded project C0PEP0D.

Applications. Candidates are invited to contact Christophe Eloy by email before July 20th, 2021 for a starting date not before October 1st. They should provide: (1) a detailed CV with publication list, (2) contact information of at least 2 academic references, and (3) a 2-page research statement describing past activities and research interests.

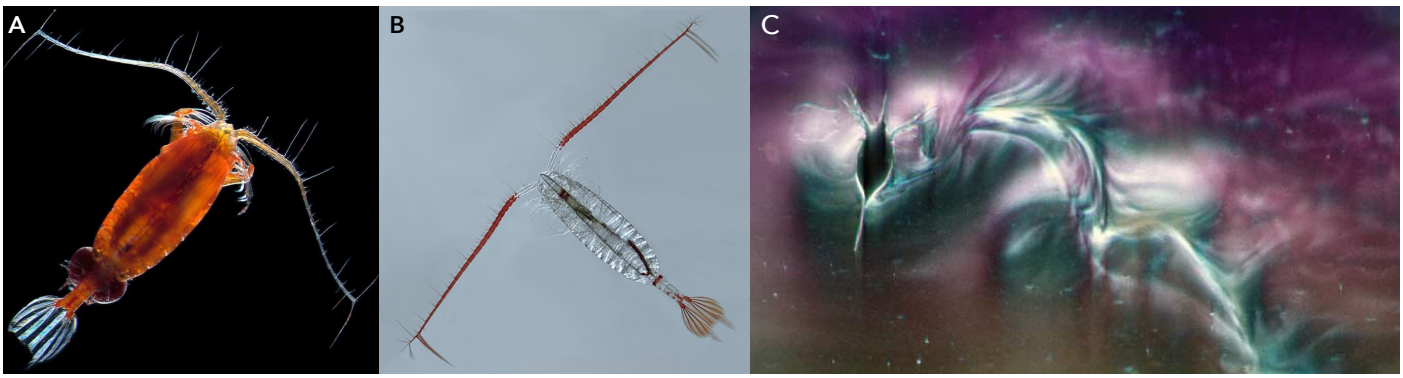

Figure. Two pictures of planktonic copepods: (A) *Valdiviella insignis*, a 9 mm long copepod living around Ireland and (B) *Calanus hyperboreus*, a 10 mm long copepod living in the Artic. Both have long antennae covered with sensing hairs that allow them to sense flow velocities and chemical concentrations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