Postdoctoral Researcher Position Bio-inspired collective navigation in complex flows



Type: Theoretical/Numerical Location: IRPHÉ, Marseille, France Contract duration: up to 3 years, funded by the French National Research Agency (ANR) Gross salary: between 3081 € and 4292 € per month, depending on experience Starting date: flexible Contact: Aurore Loisy (aurore.loisy@univ-amu.fr) https://auroreloisy.github.io/

Project. Inspired by the collective migration of various living organisms, this interdisciplinary project aims at uncovering the cooperation strategies that swarms can use to navigate in noisy environments, in particular in the presence of transport by complex flows. Understanding how environmental signals can be exploited at the group level will shed light on algorithms used in nature and will inspire new designs for robot swarms with navigation capabilities.

The project will require 1) implementing custom flow environments (CFD), 2) devising novel agent-based models with original emergent properties, as well as 3) optimizing swarm behaviour using deep reinforcement learning. Depending on their background and preferences, the postdoctoral researcher will contribute to one or more of these aspects.

Environment. The successful candidate will join the "Living and bio-inspired systems" group at the 'Institut de recherche sur les phénomènes hors équilibre' (IRPHÉ), a physics/mechanics lab located in Marseille. They will be part of an international team of researchers working on bio-inspired navigation, smart active particles and collective behaviour.

Profile. Candidates should have an outstanding track-record, a background in either active matter physics, reinforcement learning or transport/mixing in complex flows (e.g., turbulent), as well as a taste for interdisciplinary research and programming (Python).

Application. Candidates are invited to contact Aurore Loisy by email. They should provide: (1) a detailed CV with publication list, (2) contact information of at least 2 academic references, and (3) a research statement (max 2 pages) describing past activities and research interests. Informal inquiries are also welcome.