

ACADEMIC POSITIONS

JOB DESCRIPTION

- **JOB TITLE/PROFILE**

PhD position

- **RESEARCH FIELD(S)¹**

Environmental Sciences - Geosciences

- **JOB DESCRIPTION**

The Ocean Sciences Institute with A*midex is funding 3years PhD position (co-funding by the Région SUD is pending)

Microplastics (MP) are present in all ocean reservoirs. Over the last decade, studies have focused on understanding the input and distribution of MP in the surface ocean. The life cycle of MP in the ocean and the processes influencing its vertical transport and long-term accumulation in sediments are only partially understood. It is noteworthy to obtain an accurate estimate of the fluxes and stocks of plastic in sediments to test the "missing plastic paradox" issue. The vertical transport of MP in the water column is highly dependent on physicochemical properties such as polymer density, size and shape. Marine biological factors (e.g. biofilm formation, aggregation) may also exert a major influence on the vertical flow of PM but remain poorly documented. Coastal zones are of major interest because they concentrate most plastics and act as a trap for many pollutants. In this context, we are proposing an interdisciplinary PhD project with 2 main focuses: 1/ the estimation of plastic fluxes and stocks in sediments and 2/ the study of aggregation processes between MP and phytoplankton (based on *in situ* and *ex situ* experiments). To achieve these objectives, we will collect water and sediment samples and use sediment traps deployed in the Bay of Marseille, France's largest coastal conurbation, and in the adjacent area of the Calanques National Park. This approach will provide data for the quantitative estimation and characterization of vertical fluxes of MP and for the study of interactions between MP and biological factors. In parallel, controlled laboratory experiments will be carried out to study the aggregation processes between MP and phytoplankton (environmental conditions and kinetics). The characterization of MP and microalgae collected *in situ* will provide the conditions required to study aggregation processes and fall rates in the laboratory. The stock and fate of particles buried in the

¹ **Social Sciences** - Law, Education, Economics, Social Science, Psychology - **Political Science** - Political Science - **Computational Sciences** - Computer Science, Mathematics - **Engineering** - Architecture and Design, Engineering - **Natural Sciences** - Biology, Chemistry - **Physical Sciences** - Physics, Space Science - **Environmental Sciences** - Agricultural Science, Geosciences - **Humanities** - Theology, Philosophy, Literature, Linguistics, History, Anthropology, Arts and Culture - **Medical Sciences** - Medicine

sediment will also be studied using sediment coring. These results will make it possible to quantify the fluxes of MP to the sediments, to understand the processes behind their vertical transport and finally to enable quantitative monitoring of historical pollution.

○ **QUALIFICATIONS/SKILLS/EDUCATION & RESEARCH REQUIREMENTS**

Candidates must have a Master degree in geosciences, environmental chemistry or oceanography. Experience (at sea if possible) and laboratory experience (ability to work in a laboratory with repeated manipulations) are expected. Students should have good communication skills and a good level of English (written and spoken) with a desire to work in a team but also independently. A good general knowledge of geosciences and ocean biogeochemistry is welcome.

○ **APPLICATION DEADLINE**

1st of May 2024. International candidates are encouraged to apply

○ **STARTING DATE**

The position is available for 10 months ideally starting in September 2024

○ **JOB LOCATION**

CEREGE – Arbois – Aix en Provence

○ **REQUESTED DOCUMENTS OF APPLICATION**

Letter of motivation, CV and 2 reference letters.

○ **CONTACT TO APPLY**

yoan.furtado@osupytheas.fr

virgnie.sanial@univ-tln.fr

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