ABSTRACT:
Through accidental release and indiscriminate discards, plastic wastes have accumulated in the environment at an uncontrollable rate. Not only is the toxicity of nanoplastics (NPs) of major concern, but also NPs associated-toxicants. Recent studies of the size distribution of the plastic debris suggested that continued fragmenting of microplastics into nanosized particles may occur. At the same time, plastic particles uptakes by marine organisms are inversely related to particle size. Indeed, persistent toxic contaminants associated with NPs may firstly originate from the pellet formulation, because various kinds of additives are used during the manufacturing of plastics to increase its durability. Furthermore, due to their large surface-to-volume ratio, NP may adsorb larger amount of external toxic compounds than microplastics. Our objective is to develop a new approach based on NP models to environmental sample for a better understanding of the physico-chemical behavior via coupled analytical methods based on mass spectrometry.

Mots clés (Keywords): nanoplastics, coupled analytical method, mass spectrometry
make it possible to display an original position in the field of applications in many industrial sectors both at national and international level.

### MISSION - ACTIVITÉS PRINCIPALES / MISSION – PRINCIPAL ACTIVITÉS

#### I. Le contexte scientifique Scientific Context

Nanoplastics (NPs) are emerging pollutants that can affect the marine environment. The European Union has acknowledged this problem and the need of better monitoring the occurrence of NPs in the oceans. However, up to now, there is little or no monitoring data on the occurrence of this kind of pollution, since its investigation is hampered by the lack of a comprehensive chemical and physico-chemical study to access to their behavior within the environment in the presence of inorganic and organic toxicants.

**What we offer:**
- a challenging project
- a structured Ph.D. program within the Doctoral School of Exact Sciences and their Applications, ED 211
- a working in a creative team
- an interesting and dynamic working environment
- an innovative multifaceted research activities

#### II. Les objectifs Objectives

Model and environmental NPs will be studied in order to understand the environmental behavior of this new class of emerging pollutant in interaction with heavy metals. Different analytical methodologies based on coupled techniques and mass spectrometry will be developed to access to the NPs characterization in terms of size, distribution and morphology as well as to evaluate the Trojan horse effect of nanoplastics (NPs). This term was recently used to warn the community about the notion of microplastic and a fortiori nanoplastics concentrate pollutants acquired from the surrounding environment and potentially released them into tissues or cells of the ingesting organism as bioavailable contaminants.

#### III. Literature References


### COMPETENCES REQUISES / REQUIRED COMPETENCES

The candidate should have a Master degree in Chemistry and knowledge in polymer science and analytical coupled methods. Knowledge on ICP-MS and/or Field Flow Fractionation will be considered as a plus. Further requirements include the capability of conducting independent research, scientific writing, good communication skills in English, and amenability to work with project partners. Proficiency in French is advantageous but not a requirement. The successful candidate should show an exceptional level of motivation, and readiness to push a demanding research project forward.
CRITÈRES D’ÉVALUATION DE LA CANDIDATURE / CRITERIA USED TO SELECT CANDIDATE

Application file assessment: Selection committee
Candidates will first be selected based on their application file.
Those selected after this first step, will then be interviewed.
Application will be evaluated based on the following criteria:
1. Grades and ranking during her/his Master degree, steadiness in academic background
2. English language proficiency
3. Candidate’s ability to present her/his work and results, candidate’s motivation, scientific maturity and curiosity
4. Work experience similar to an internship in a laboratory – or likewise; previously achieved research work (reports, publications).

CONSTITUTION DU DOSSIER DE CANDIDATURE, DATE LIMITE DE DEPOT / REQUIRED DOSSIER, DATE

Please send the following documents before 2018/06/15:
- A motivation letter
- A curriculum vitae
- The academic transcripts of the marks (1st and 2nd year of master degree)
- Contact details of two referees

DATE LIMITE DE DEPOT DU DOSSIER (limiting date): 2018/06/15

CONTACTS

E-mail: stephanie.reynaud@univ-pau.fr