NOTIFICATION OF PROPOSED RESEARCH CRUISE
COUNTRY : ICELAND,
NAME OF THE CRUISE : ANDROMEDA

French Institutions involved: French partners of the EU project Andromeda
Mediterranean Institute of Oceanology (MIO)/CNRS, IFREMER,

PART A: GENERAL

1. NAME OF RESEARCH SHIP: **"Le Commandant Charcot"**

2. DATES OF CRUISE: 30/04/2022 to 10/05/2022

3. OPERATING AUTHORITY: PONANT

TELEPHONE: +47 23411080 / +881 677 105 461

TELEFAX: N/A

TELEX: N/A

4. OWNER (if different from no. 3)

5. PARTICULARS OF SHIP:

Name: "Le Commandant Charcot"
Nationality: French
Overall length:149.9 m
Maximum draught:10.2 m
Net tonnage:9384
Propulsion e.g. diesel/steam:diesel - LNG
Call sign:FMNB
Registration port and number (if registered fishing vessel)

6. CREW

Name of master: Captain Etienne Garcia and/or Captain Patrick Marchesseau

Number of crew: 216

7. SCIENTIFIC PERSONNEL (Affiliations: Mediterranean Institute of Oceanology (MIO)/ CNRS, IFREMER)

Name and address of scientist in charge of the andromeda project :
Richard Sempéré, PhD, MIO (https://www.mio.osupytheas.fr/fr/richard-sempere),
richard.sempere@univ-amu.fr
Tel: +33 (0)616424820

Name and address of scientist in charge of the present application
Francois Galgani, PhD, IFREMER, project manager, francois.galgani@ifremer.fr,
Tel +336 38425290

No. of scientists: 4 IN TOTAL FOR THE ARCTIC CRUISE

- Richard Sempéré, PhD, MIO (https://www.mio.osupytheas.fr/fr/richard-sempere), richard.sempere@univ-amu.fr
- Christophe Brach, PhD; IFREMER, Environmental and analytical chemistry, monitoring of chemical and microplastic contaminants, (https://annuaire.ifremer.fr/cv/17124/)
- Mélanie Ourgaud, PhD, MIO, Oceanographer, Food web impact of plastic pollution and organic plastic additives (https://www.mio.osupytheas.fr/fr/melanie-ourgaud)
- Jean Louis Gonzalez, IFREMER, chemistry, passive samplers (ehttps://annuaire.ifremer.fr/cv/16087/en/)

8. GEOGRAPHICAL AREA IN WHICH SHIP WILL OPERATE (with reference to latitude and longitude)

West Iceland (63.8°-65.5°N/ 21.8°-24.6° W)

9. BRIEF DESCRIPTION OF PURPOSE OF CRUISE ANDROMEDA

The proposal is based on a contribution from two scientific partners of the European JPIOceans project Andromeda (https://www.jpi-oceans.eu/andromeda). The objective is, to assemble an interdisciplinary proposal to cover the main aspects of plastic pollution. This preliminary studyt aims at providing information on the level of plastic pollution and associated contaminants in regions that are most often considered as pristine. It will also provide the necessary scientific and technical basis for further studies and possible long-term monitoring, with data to be ingested by the IOC/ Global Ocean Observing System (GOOS) database , as part of the International Marine Debris Observing System (IMDOS).

10. DATES AND NAMES OF INTENDED PORTS OF CALL

Start 30/04/2022 REYKJAVIK (ICELAND) – End 10/05/2022 REYKJAVIK (ICELAND) with a cruise outside of icelandic waters (in Greenland) from 02/05 to 08/05/
The cruise will have stops for sampling in Iceland after departure from Iceland (on 30/04 or 01/05, or coming back to Iceland, on 09/05 or 10/05

11. ANY SPECIAL REQUIREMENTS AT PORTS OF CALL NOTIFICATION OF PROPOSED RESEARCH CRUISE

Scientific material will be embarked on April 26th, in France (Le Havre), stored on board after the end of the cruise for a future cruise in Antarctica.

PART B: DETAILS

1. NAME OF RESEARCH SHIP: “Le Commandant Charcot"
CRUISE NO. 0300422

2. DATES OF CRUISE: 30/04/2022 to 10/05/2022, in Iceland from 30/04 - 01/05, and 09/05 - 10/05

3. a) PURPOSE OF RESEARCH PROGRAMM

The proposal is based on a contribution from two scientific partners of the European JPI-Oceans project Andromeda (https://www.jpi-oceans.eu/andromeda). The objective is, to assemble an interdisciplinary proposal to cover the main aspects of plastic pollution. This preliminary project aims to provide information on the level of plastic pollution and associated contaminants in regions that are most often considered as pristine. It will also provide the necessary scientific and technical basis for further studies and possible long-term monitoring, with data to be ingested by the IOC/ Global Ocean Observing System (GOOS) database , as partoof the International Marine Debris Observing System (IMDOS).

The design of the experiment is also organized in order to better understand the plastic/microplastics/contaminant interactions as well as chemical contamination of the water and sediments by additives, chemicals, but also emerging contaminants. Furthermore, we intend to improve our knowledge, by observation, on interactions of plastic with marine organisms through a preliminary assessment of interactions between plastics and tops predators (entanglement) and interactions between plastics/microplastics with their rafted species. All these approaches will focus on both the Arctic (present proposal) and the Antarctic, (planned in December 2022). The present application if for the Arctic cruise, Iceland part only.

Valorization of the results will be organized through scientific publications, and promotion of the results to international institutions (PAME, IOC/ GESAMP, EU/MSFD, G20), in which some of us are participating (IFREMER)

b) GENERAL OPERATIONAL METHODS (including full description of any fish gear, trawl type, mesh size, etc.)

Implementation of the project will focus on the following experiments:

- Surface sampling of microplastics (Manta net) and analysis/counting (laboratory/ LDIR analysis in-depth characterization of the polymers):
- Ferrybox tests, semi-automated continuous water sampling (from the ship's water circuit) for microplastics collection and analysis:
- Surface water sampling, pre-extraction on board and analysis of additives (Phthalates, Bisphenols, Organophosphate esters) and DOC:
- Sediment sampling (shallow water cores (microplastics, chemical analysis)
- Test of passive samplers (immersion for hours), surface water sampling
- Experimental collection of atmospheric microplastics through filters/ GCMS analysis, optimization of the method (for Diacides, Microplastcics, Additives)
- Continuous observations (floating macrolitter, birds and cetaceans) by line transects protocols during transits

- Sampling of plastics/microplastics for identification of rafted species (DNA analysis/Meta barcoding): 3 micropastics/ pieces of plastics at each of the 6 sites during the cruise, stored in 1,5 ml ethanol (Eppendorf tubes)

4. ATTACH CHART showing (on an appropriate scale) the geographical area of intended work, positions of intended stations, tracks of survey lines, positions of moored/seabed equipment, areas to be fished

The present application is for the part of the cruise in Iceland only

5. a) TYPES OF SAMPLES REQUIRE (e.g.,geological/water/plankton/fish/radionuclide)

a) Floating microplastics (2 maximum)
b) Sediments (3 x 250g/ 2 sites at maximum) at 10-100m depth (microplastics / chemicals
c) Surface Water (3x3 liters per sites / 2 sites for Dissolved Organic Carbon 3x3 liters per sites / 2 sites for additives):.
d) Atmospheric deposit on filters (sample collection on board, along transits/stops)
e) Passive sampling (test/ immersion at each stations for hours and recovery)

b) METHODS OF OBTAINING SAMPLES

- Surface microplastics: Manta (plankton like net for surface sampling) , 330 µm mesh, 60-120min tows at surface
- Surface sampling: Boom (from ship), stainless-steel collector, glass bottles, preextraction material on board (manifold, vacuum pump, glass cartridges containing sorbent)
- Aerosols: Filters (A4), Hi volume air sampler, onboard

- Sediments microplastics and contaminants: small volume Core grab (250g) and Van Veen grab (250g) from ship, Beach (if any access) and/or 10-100m depth
- Floating plastics and top predators: Visual observations(line transect), binoculars
- Contaminants/ passive samplers to be tested (SMPD, POCIS, or DGT type ; at stopovers or towed during cruise)
- microplastics for interaction species/ plastics (DNA analysis) are collected from Manta net collectors

6. DETAILS OF MOORED EQUIPMENT

No long term moored equipment (passive sampling from ship or passive samplers (membranes) moored for hours in shallow waters close to coasts, or towed offshore

7. ANY HAZARDOUS MATERIALS (chemicals/explosives/gasses/radioactives, etc.)

Chemicals

All solvents are used as reagent for pretreatment of samples on board☹ extraction of chemicals)

a) Ethanol 100%:(IDG/ UN 1170), 10L
b) Sulfuric Acid, H2SO4 (IMDG/ UN 2796), 50 mL
c) aceton ultrapure:-IMDG/ UN 1090), 2,5 L,
d) Chloridric Acid, HCl: (IMDG / UN1789) 5 L

Storage: Dry lab, separate container
No explosives, No gasses, No radioactive compounds

8. DETAIL AND REFERENCE OF

a) Any relevant previous/future cruises

Plastic pollution and chemical contamination have been measured on regular basis by participating scientists and Andromeda team members since decades, with cruises worldwide, including in the Artic (started with RV Atalante in 1999, AWI/ Polarstern ARK XIX, in 2003). The JPI project Andromeda includes cruises/ studies in the Mediterranean Sea, the Baltic Sea, the North East Atlantic, and Arctic regions (Norwegian partner). the present study covers a cruise in the Arctic (present proposal) and a cruise planned in December 2022 in the Weddel Sea (Antarctica)

b) Any previously published research data relating to the proposed cruise

Contribution to the topic are available at the following links
Richard Sempéré,: https://www.mio.osupytheas.fr/fr/richard-sempere) Natascha Schmidt, operational manager of the JPI-Oceans Andromeda project: https://www.mio.osupytheas.fr/fr/natascha-schmidt
Laure Papillon : https://www.mio.osupytheas.fr/fr/laure-papillon
Mélanie Ourgaud, https://www.mio.osupytheas.fr/fr/melanie-ourgaud
Dorte Herzke,: https://www.nilu.com/employee/dorte-herzke/
Christophe Brach,https://annuaire.ifremer.fr/cv/17124/)
Jean louis Gonzalez: https://annuaire.ifremer.fr/cv/16087/en/
Olivia Gerigny: https://annuaire.ifremer.fr/cv/23469/en/ F
Galgani: https://annuaire.ifremer.fr/cv/16060/.

Some of team partners (Dorte Herzke, Francois Galgani) were or are involved in artic studies (e.g. Primke et al., Monitoring of microplastic pollution in the Arctic: Recent developments in polymer identification, quality assurance and control (QA/QC), and data reporting, Arctic Sciences, in press), cruise reports (e.g Galgani F., Lecornu F.2004, Debris on the sea floor at 'Hausgarten': in the expedition ARKTIS XIX/3 of the research vessel POLARSTERN in 2003. Berichte Polar Meeresforsch. 488, 260–262) and monitoring guidelines (AMAP, 2021, https://www.amap.no/documents/download/6761/inline),

9. NAMES AND ADDRESSES OF SCIENTISTS OF THE COASTAL STATE(S) IN WHOSE WATERS THE PROPOSED CRUISE TAKES PLACE WITH WHOM PREVIOUS CONTACT HAS BEEN MADE

JPI Andromeda project Teams members have contact with the international community in the field, especially through the JPI ocean Andromeda project (Univ Gothenburg, SINTEF, Helmholtz Centre for Environmental Research, McGill University, Norwegian Institute for Air Research). And through the AMAP programme in which some of us are participating (Dorte Herzke, Francois Galgani). Some partners are specialized,in arctic studies (Dorte Herzke. , NILU, Tromso) . Strong Links are also established with the EU technical group on Marine litter (monitoring within the MSFD), OSPAR (partners are members of experts groups), One of the member (F Galgani) links with the G7, G20, UNEA, GOOS, initiatives on monitoring marine litter.

10. STATE

a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable
Yes

b) Participation of an observer from the coastal state for any part of the cruise together with the dates and the ports for embarkation and disembarkation
Possible at port, Reykjavik (30/04/2022 & 10/05/2022) but not possible during the cruises (no place available).
c) When research data from the intended cruise are likely to be made available to the coastal state and by what means

First cruise report after one month (June 10th, 2022)
Scientific report, one year after the cruise (May, 2023)

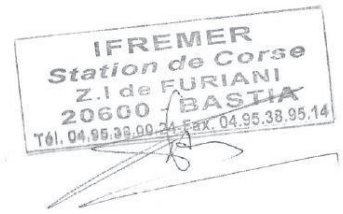
PART C. SCIENTIFIC EQUIPMENT

state : ICELAND Port of call: Reykjavik Dates: 30/04/2022 to 01/05/2022 & 08/05/2022 to 10/05/2022

				distance	from the	Coast
List scientific work by function e.g.	Water column including sediment sampling of the seabed	Fisheries research within fishing limits	Research concerning the natural resources of the continental shelf or its physical characteristics	Within 4 nm	between 312 nm	between 12-200 nm
Manta net Sediment (grab) Water) Aerosols Passive samplers	YES YES YES NO YES	NO NO NO NO NO	NO NO NO NO NO	YES YES YES YESe YES (tests)	YES NO YES YES YES (tests	YES NO Possible YES NO

Bastia, on April, 01st

F Galgani, chef scientist



NB IF ANY DETAILS ARE MATERIALLY CHANGED REGARDING DATES/AREA OF OPERATION AFTER THIS FORM HAS BEEN SUBMITTED, THE COASTAL STATE AUTHORITIES MUST BE NOTIFIED IMMEDIATELY