BACKGROUND INFORMATION

Missions
Data
Communication

MISSIONS

The French Polar Institute is a public organization responsible for bringing to fruition French research operations in the polar regions of the Globe.

Access and living conditions in these zones of the world are difficult. The French Polar Institute deploys substantial resources and specially adapted, technologically advanced systems to research sites.
The Institute also employs people with the special knowledge and skills required for top quality scientific research in extremely harsh polar conditions.

Recruitment
of the personnel needed for upkeep and maintenance of research stations and for ensuring the continuity of scientific studies over the Southern winter

Transport
and transfer of freight and personnel between mettropolitan France and the various destinations

Development
of new technological solutions for logistics and polar infrastructure

Ensuring
sustained maintenance of research stations

Dissemination
of scientific knowledge concerning the polar environments

Organization
and planning of technical programmes and scientific projects

Selection
of scientific projects through assessment by the French Polar Institute's Scientific Committee, finance for their field-operations and for expedition organization

Training
safety and security of all concerned

Supply
of equipment well adapted for life in polar environments

Directorate

From June 2020 to March 2021

Président

Yvon LE MAHO
Institut Pluridisciplinaire Hubert Curien

Advisory representatives of IPEV member organisations

Marie-Hélène TUSSEAU-VUILLEMIN
Alain LAGRANGE
Ministère de l'Enseignement Supérieur, de la Recherche et de l'Innovation

Dominique WAAG, Jérémie FORRAT-JAIME
Ministère de l'Europe et des Affaires Étrangères

Nicolas ARNAUD, Cyril MOULIN
CNRS

François HOULLIER
IFREMER

Elsa CORTIJO, Marie-Thérèse MENAGER
CEA

Juliette LAMBIN
CNES

Alain SOULAN
Météo France

Evelyne DECORPS, Charles GUISTI
TAAF

Jean-Claude DUPLESSY, Jean-Pierre JACQUIN
EPF (Membre démissionnaire depuis décembre 2020)

Advisory members of the board

Isabelle DELACROIX
Commissaire du Gouvernement

Éric PREISS, Christophe VILLEGAS
Contrôle général économique et financier

Christiane LAURENT-MONPETIT, Camille SERVETTO
Ministère de l'Outre Mer

Clémentine RENEVIER, Carole SEMICHON, Maude JOLLY
Ministère de la Transition écologique et solidaire

Fatima LAGGOUN
Personnalité extérieure (CNRS - INSU)

Representation in international bodies

From April 2020 to March 2021 (ended)

Jérôme CHAPPELLAZ

• Member of the French delegation to the Antarctic Treaty (RCTA) and Environmental Protection Committee (EPC) meetings

• French delegate to the Council of National Antarctic Programme Managers (COMNAP)

• Full member of the European Polar Board (EPB)

• French representative to the Ny-Alesund Scientific Operators Committee (NySMAC)

• French representative to the Arctic Research Operators Forum (AROF), and member of the Executive Committee

• French representative in the International Arctic Science Committee (IASC), on behalf of CNRS

• Member of the steering committee of TGIR Concordia

• Participant in the "EU-PolarNet" consortium

• Co-coordinator of the "logistics" working group of the European project "Beyond EPICA

• Representative of the Institute in the International Ice Memory Foundation

Christine DAVID-BEAUSIRE

• Alternate member of the European Polar Board (EPB)

• French representative on the Ny-Alesund Scientific Operators Committee (NySMAC)

• French representative to the Arctic Research Operators Forum (FARO)

Gaëlle SELLIN,
Laurent DE BOISSIEU (from march 2021)

• French deputy delegate to the National Antarctic Programme Managers' Council (COMNAP)

Participation of Jérôme Chappellaz in European or international meetings

by vidéoconférence

- Public consultation of the Council of National Antarctic Programme Managers - COMNAP • **APRIL 2020**
- EU-PolarNet consortium meeting and webinar • **APRIL & JUNE 2020**
- Concordia Steering Committee • **APRIL, JUNE, OCTOBER, DECEMBER 2020 ET JANUARY 2021**
- European Polar Council plenary and annual meetings • **APRIL, JULY, OCTOBER 2020 & MARCH 2021**
- Ice Memory Steering Committee • **MAY, JUNE, SEPTEMBER, NOVEMBER & DECEMBER 2020**
- Arctic Research Operators Forum (AROF) Executive Committee **MAY, JULY, SEPTEMBER, OCTOBER, DECEMBER 2020 & FEBUARY 2021**
- Executive Committee of the European project "Beyond EPICA" • **JUNE, SEPTEMBER, DECEMBER 2020 & MARCH 2021**
- Council of National Antarctic Programme Managers - COMNAP – Antarctic Tourism Meeting • **JUNE 2020**
- General Assembly and regional meetings of the Council of National Antarctic Programme Managers - COMNAP • **AUGUST 2020**
- Preparatory seminars for the 3rd Arctic Ministerial Summit • **OCTOBER & NOVEMBER 2020**
- Ice Memory Foundation Council • **MARCH 2021**
- Annual meeting of the Arctic Research Operators Forum • **MARS 2021**
- International Arctic Science Committee • **MARS 2021**

- Meeting with the Directorate of the Swiss Polar Institute in Lausanne • **OCTOBER 2020**

Participation of Christine David-Beausire in European or international meetings

by vidéoconférence

- Ny-Alesund Science Operators Committee (NySMAC) • **MARCH 2020 & MARCH 2021**

Organization chart

Direction

Jérôme CHAPPELLAZ
Directeur

Christine DAVID-BEAUSIRE
Directrice adjointe

Fanny KERAUDY
Assistante de direction

Claire LE CALVEZ
Responsable Qualité Sécurité Environnement

Département exploitation

Laurent DE BOISSIEU
Directeur

Arctique

Dominique FLEURY
Responsable

Serge DRAPEAU
Adjoint

Subantarctique

Yann LE MEUR
Responsable

Romuald BELLEC
Adjoint

Brendan CORBEL
Assistant

Antarctique

Laurent DE BOISSIEU
Responsable

Doris THUILLIER
Responsable science

Plateforme logistique

Yann L'HERROU
Responsable

Jean-Yves VITOUX
Technicien logistique

Killian POUPON
Technicien logistique

Infrastructures

Armand PATOIR
Concordia

Michel MUNOZ
Florentin CAMUS
Gestion des fluides

Jean-Gabriel COLL
Électricité, production et distribution

Anthony VENDÉ
Mathieu GOUSSIN
Raids, mécanique véhicules et centrales électriques

Serge DRAPEAU
Bâtiments, chaudronnerie, conception

Nathalie AUFFRET
Aménagements bâtiments et achats second oeuvre

Serge DRAPEAU
Moyens maritimes

Romuald BELLEC
Bâtiment siège

Département communication et médiation scientifique

Aude SONNEVILLE
Responsable communication

Lucie BONHOMME
Adjointe

Département sciences et technologies

Christine DAVID-BEAUSIRE
Directrice

Valérie HADOUX
Assistante

Doris THUILLIER
Coordination scientifique

Département télécommunications, informatique instrumentation

Thierry HÔTELIER
Directeur

Serge BEGON
Systèmes/réseaux

Gilbert CALVEZ
Gestion des parcs

Michel MUNOZ
Système d'information

Département ressources humaines

Laurence ANDRÉ-LE MAREC
Directrice

Sandrine DROUMAGUET
Assistante recrutement

Agence comptabilité

Olivier SAUVAGE
Agent comptable

Dominique PRISAC
Assistante comptable

Département administratif et financier

Marie-Agnès FOUCHER
Directrice administrative et financière

Personnels et finances

Viviane JEAN
Responsable

Viviane JEAN
Antarctique

Danielle GUÉGUENIAT
Arctique et contrats européens

Annie JAOUEN
Îles subantarctiques

Fiona BRUNA
Assistante administrative

Approvisionnement, achats, import/export

Isabelle THÉPAUT
Responsable

Pauline DUFRECHOU
Arctique, Antarctique

Laurence RAFFARD
Îles subantarctiques, Antarctique et siège

Isabelle THÉPAUT
Support moyens généraux

COMMUNICATION
FRENCH POLAR INSTITUTE

**In 2020, the communication department had made good progress on the preparations for the maritime festivals that were to be held during the summer.
The pandemic changed the situation but the management decided to maintain the planned creations in order to have them available and to use them for other activities, which was confirmed in 2021.**

This year 2020 was marked by a slowdown in institutional communication due to the pandemic but an increase in crisis communication. The end of the CDD in July allocated until now to the communication department also caused a slowdown in general activities, the two remaining people had to share the tasks of this person as well as the management of the projects engaged on the basis of a functioning of 3.

As of March 2021, the Institute had 1 with 724 NEW SUBSCRIBERS in 2020

POSTS
The four tweets that generated the most interactions

January 2020: 12,7 K
After 50 days on the arid plateaus of the #Antarctic to study the reaction of the continent to global warming, the @eaiist raid left this morning from #Concordia towards Cape Prud'Homme in Terre Adélie. @CNRS © Jean-Yves Vitoux - French Polar Institute pic.twitter.com/T9FPFjR0Nn

May 2020: 4508
In #Concordia, it's time for the winterers to say goodbye to the sun and see you in 3 months. The polar night will soon begin! Thanks to Sylvain for his great pictures! @ItaliAntartide @esa #Antarctica ©Sylvain Guesnier - French Polar Institute pic.twitter.com/aXDnrZR1jP

June 2020: 2294
Happy #Midwinter to all winterers in the #subantarctic islands and the #Antarctic. Happy #Midwinter to all overwinter teams of the subantartic islands and Antarctica © Serge Begon - French Polar Institute pic.twitter.com/ix8Aa1uVeR

December 2020: 5355
The French Polar Institute is recruiting! #@_IPEV #Job facebook.com/28549185148439...

8041
Page « Likes »

PUBLICATIONS 227
129 photos
78 links
13 external video shares
5 statuses

1652
Daily reach
number of people for whom content related to the page was displayed Daily reach
number of unique users who saw content related to our page

166
Utilisateurs engagés en moyenne personnes / jour

nombre de personnes ayant interagi avec la page

The most successful days were the following

26/02 (19596 users reached/446 engaged) the day of the publication of the Concordia winterers' portraits

09/04 (6890 users reached/ 1071 engaged) the day of the publication of the night pictures of Dumont d'Urville

18/05 (8969 users reached/1054 engaged) a day where there were 3 publications, a photo of the first egg-laying of the emperor penguins, a link to the news of the publication of a scientific article on the feeding of Adélie penguins and a series of photos of Adélie land

AN EXAMPLE OF PARTNERSHIPS SET UP IN 2020

Establishment of a partnership with the association APECS France especially around the Polar Week. This event takes place twice a year, around the equinoxes (March and September). It is often the occasion of a week of video-conferences for the young, very young and less young, in which scientists present different aspects of science at the poles. The idea is to provide elements of understanding of how the poles work for all levels.

3 public videoconferences were organized by APECS-France in partnership with the Institute:

May 13
Concordia winter students

September 26
Concordia winter students

December 14
Dumont d'Urville station, on the research activities conducted at the station

THE NEW FILMS

- **Presentation of the logistics at Dumont d'Urville**
- **Logistic support to science at the Arctic station AWIPEV**
- **Logistics in the subantarctic islands**
- **Concordia, extreme station**

A NEW POLAR ARCHIVE ONLINE

The treatment, inventory, sorting and description of the Corbel collection, related to the French scientific presence in the Arctic, has been completed with more than 3000 documents, iconographies, letters, notes, maps, etc. To be consulted on the portal of the French polar archives, Archipôles.

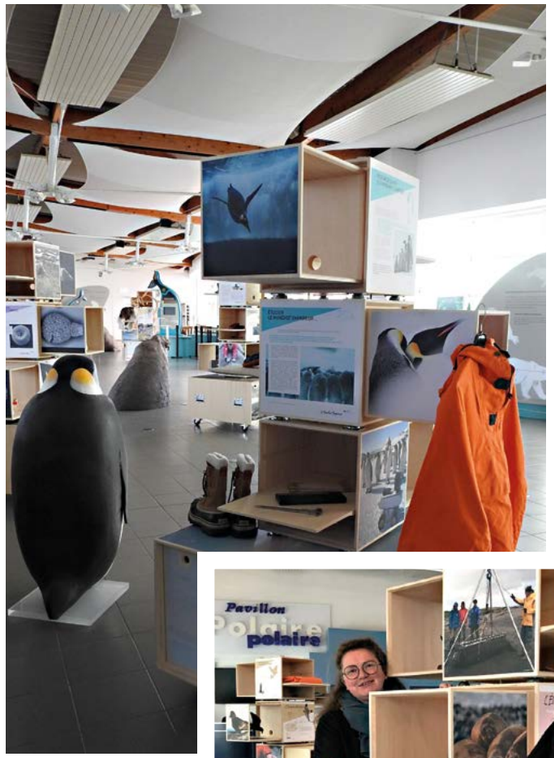
EDITION

The Communication Department, together with the Director of the Institute, wrote a long article for a book to be published in October 2020, at the request of the French Institute of the Sea: "Découvrir le monde, Brest port d'explorateurs". This 6-page article, about 2400 words long, is dedicated to the Polar Institute and tells a story from the beginnings of the exploration of the poles to the new types of exploration today: scientific research and the logistical means on which it relies in the framework of the Polar Institute's missions.

Scientific culture

CREATION OF EXHIBITIONS

- Creation of the exhibition "Polar animals, a life of a scientist": each animal is represented on a wooden totem, composed of a reconstitution of the dedicated animal and accompanied by short explanations on its role in scientific research: the place where it lives, its characteristics, its use in science and the link with climate change...
- Creation of a new institutional exhibition of the Polar Institute with 12 panels installed in all the Antarctic, Arctic and Subantarctic stations as well as at the Institute's headquarters in Brest.



Thank you Anne.

EVENTS

Fête de la Science: participation in the Brest Science Village, at the Capucins workshops for 2 days (the days dedicated to schools having been cancelled). The Polar Institute animated a game on the incredible characteristics of the polar and subpolar fauna. The Science Village welcomed a total of 4020 people despite the sanitary restrictions.

LOAN OF EXHIBITION MATERIAL

EXHIBITION Emmanuel Lepage, the explorer at the Brussels Comic Book Museum, from Octobre 1, 2019 to March 8, 2020 : 124 051 visitors in total

EVENT le Carré au kids/Cap sur la banquise at the Carré Belle-Feuille in Boulogne-Billancourt, from January 16 to February 15, 2020

EXHIBITION Discovery of Antarctica, at the library of Plouha, from January 23 to February 14, 2020

EXHIBITION Les terres du vent et des glaces, an exhibition on the work of Emmanuel Lepage in the TAAF presented at the central university library of the University Rennes 2, from Octobre 5 to November 10, 2020

EXHIBITION at the CDI of the Jean Moulin high school in Châteaulin, from September 23 to November 4, 2020

Correspondance

BETWEEN THE FIELD (2020/2021 WINTERERS) AND SCHOOL CHILDREN

Antoine, computer scientist in Amsterdam, and a primary school class

Camille, biologist-ecologist for the 136 project in Crozet, and the 9 students of the ULIS class of the Sainte-Thérèse B elementary school in Fort de France

Maël, computer scientist in Crozet, and the class of CM2 of the Notre-Dame school in Questembert

Alexis, ecologist for the 136 project in Kerguelen, and the first year Bac pro Laboratory Quality Control (22 students) and first year Bac techno Sciences and Technologies of Agronomy and Life (11 students) of the high school of Arcs sur Argens

Matthieu, biologist-ecologist for the 136 project in Kerguelen, and two classes of 5th graders from the Jean Perrin high school in Kremlin-Bicêtre

Clément, computer scientist in Kerguelen, and the CE-CM of the schools St Louis de Montfort de la Chèze and Jeanne d'Arc de Saint Barnabé

Pierre, cook at Dumont d'Urville, and the CE2 class (19 students) of Trévoux, the CE1/CE2 class of Scaër, the CP-CM1 diwan class of Plougastel

Nathan, baker and confectioner from Dumont d'Urville, and the 5th grade classes.

Mickaël, carpenter in Dumont d'Urville, and the CM2 class of the Saint-Clair school in Brignais

Mickaël, weather technician in Dumont d'Urville, and the CE1-CE2 class of La Chapelle Launay

Serge, district manager at Dumont d'Urville, and the class of CE2 of the school of the small hare of Marensin of Vielle Saint Girons and the school of Châtel in Trièves

Charles, mechanic in Concordia and the high school of public works of Bruay-la-buisière and the high school of the trades Château Potel of Ferté-Milon

Denis, chemist in Concordia and the 5th grade classes of the Pierre de Dreux high school in Saint-Aubin du Cormier

PARTNER
ITALY

ITALY
FRANCE

Interview

ROBERTA MECOZZI

Italy and France have been building and managing the Concordia research station in the heart of the Antarctic plateau for 17 years now, which has allowed them to achieve important scientific results by valorizing the skills of the different research institutes. Having a station in such an isolated location, far from the coast, is a real logistical challenge, which is why the French Polar Institute and the Italian National Antarctic Research Program (PNRA) have pooled their resources to create the first and only example in Antarctica of shared governance of a station.

The collaboration between the PNRA and the French Polar Institute began in the early 1990s as part of the European EPICA project at Dome C. This remote area at 3273 m on the plateau is a site of great scientific relevance, not only for glaciological research. The engineer Mario Zucchelli, director of the PNRA at the time, saw an opportunity to be seized. The first consultations led to an agreement in 1993 for the construction of a research station in Dome C followed by agreements between the two governments, renewed in 2017, and finally between the operators for the management of the station. Opened for its first wintering in 2005, Concordia is an active station all year round.

The Italian PNRA is entering its 36th year of operations in Antarctica and is part of one of the most experienced Antarctic programs in the management of intercontinental and continental flights. In Antarctica, it also manages the Mario Zucchelli Coastal Station in Terra Nova Bay and an oceanographic vessel, the Laura Bassi, used for resupply and research. It is particularly its experience in managing air operations that has been complementary to that of the French Polar Institute to implement scientific projects in hostile environments where the exchange of logistical support is essential, especially considering the high costs to be borne by the institutions.

The recent COVID-19 health crisis is the latest example of the pooling of resources from both states for the management of the 2020-2021 summer campaign. Transportation from the mainland was shared and the Dumont D'Urville, Mario Zucchelli and Concordia stations were combined into a single health bubble, with shared common procedures and rules.

This friendship has been rekindled through the commitment of the 2 institutions to support the new Beyond EPICA drilling aimed at recovering the oldest ice in the world, as well as through the Ice Memory project which plans to create in Concordia a protective sanctuary of the memory of ice collected from the world's endangered glaciers for the benefit of new generations.

SCIENTIFIC PROJECTS **SUPPORTED** in 2020-2021

Once again this year, the pandemic and its accompanying restrictions have disrupted the implementation of many projects. While 13 new projects were validated by the PSTC, only 2 were implemented in the field and 11 were rescheduled for 2021-2022.

The Arctic was the most affected because in many cases project leaders were unable to obtain entry permits for the countries around the Arctic Circle. Although it has no countries and no borders, Antarctica was not spared either, as all operators were instructed to prevent the Covid virus from entering the continent at all costs. As a result, missions were reduced as much as possible, giving priority to long-term monitoring, ongoing projects or projects funded by the French National Research Agency or the European Union.
The project leaders have been exemplary in reducing their campaigns and helping us to ensure that we can function in this particular context

new scientific projects supported in 2020-2021

Life sciences

600 SOHN AREA

Southern Ocean Hydrophone Network at AREA V

Deployment of an autonomous hydrophone for passive acoustic monitoring of the underwater sound environment and in particular cetaceans for one year.
The attachment project is Southern Ocean Research Partnership (SORP).

ANTARCTIC — **Flore** SAMARAN

1233 ICAR

Impact of global Change on Arctic Rodent communities

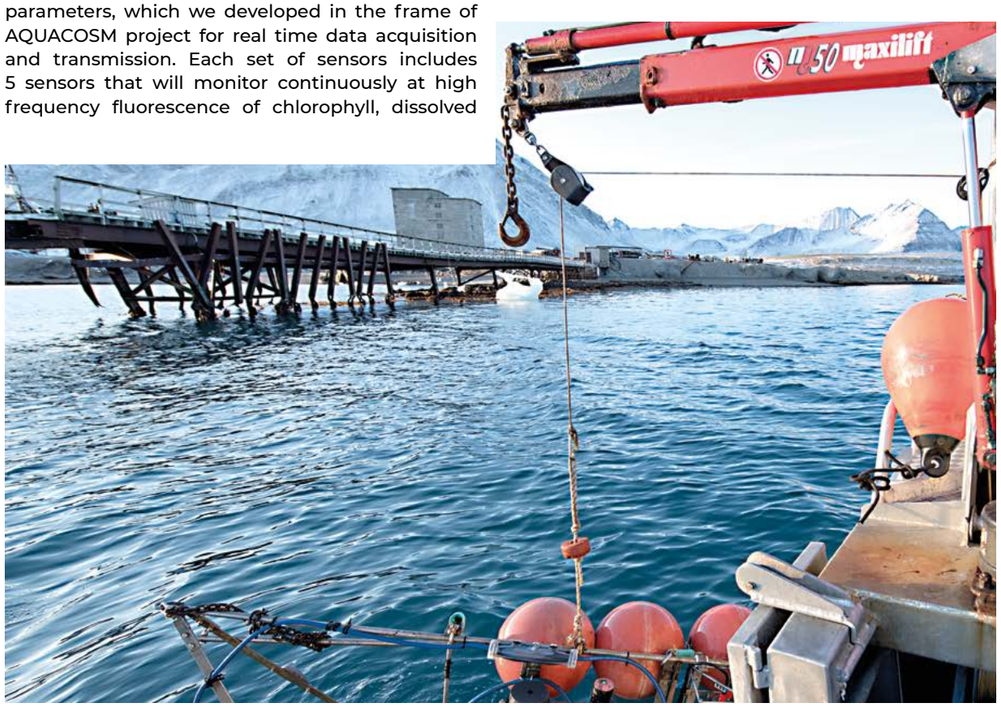
The Arctic habitats are characterized by extreme climatic and environmental conditions with high seasonality and restriction of resources for the development of vegetation. Therefore, faunas adapted to these conditions have developed different strategies to cope with them, such as migration or hibernation. Arctic rodents have the particularity to maintain an activity all throughout the year, especially during the cold season, constituting thus the main resources for numerous predators in this ecosystem, and the cyclic dynamics of these key-species is a major driver of the fluctuations of the tundra food web. For the past fifty years, these habitats are undergoing significant changes, leading to new constraints on the organisms causing imbalance in the communities, as observed by Russian colleagues on the Yamal Peninsula (Siberia). These colleagues have a large collection of rodents for this time span on a North-South transect along this Peninsula, from different biological stations, with associated data (densities of prey-predator, climatic parameters). This project aims to study rodent populations subjected to degrading ecological conditions and therefore probably to important stress that will be evaluated by different proxies including morphological variability. Following a first exchange (as they came in France during last February), the Russian colleagues propose to us to access on the one hand to this material and on the other hand to make additional field missions to target key study species in an ecological monitoring. To do so, the project requests funding for field missions and for acquisition of materials (field measurements for 2D and 3D morphometrical analyses).

ARCTIC — **Aurélien** ROYER

1240 NY-ÅLESUND-PLANKTON

Study of Ny-Ålesund plankton community responses to brownification by using high frequency data of autonomous sensors and by conventional measurements during an in situ mesocosm experiment

The release of terrigenous organic carbon to the Arctic Ocean, due to the reduction of the permafrost and the consequent increase of freshwater inflow to the sea, is one of the major consequences of global climate change. This process is also called brownification. The objective of the Ny-Ålesund-Plankton project is to study experimentally in natural conditions the response of the Arctic marine plankton community to brownification. The Ny-Ålesund-Plankton project will be realized in Svalbard in June 2020 as the French contribution to the AQUACOSM European project. Mobile in situ mesocosms will be brought and established by the Norwegian and German partners of AQUACOSM with financial and logistic supports of the European project. Mesocosms will be immerged in the Ny-Ålesund coast and brownification will be simulated by the addition of organic matter. In these in situ mesocosms we will deploy six set of autonomous sensors, measuring physical and biogeochemical parameters, which we developed in the frame of AQUACOSM project for real time data acquisition and transmission. Each set of sensors includes 5 sensors that will monitor continuously at high frequency fluorescence of chlorophyll, dissolved oxygen, conductivity, water temperature and underwater light during two weeks of non-stop mesocosm experiment. In addition, using conventional approaches we will study the dynamics of different phytoplankton groups and its photosynthetic activity, dissolved oxygen, growth rates of bacterioplankton, pico- and nanophytoplankton and that of the whole phytoplankton community and of major groups, and their predator grazing rates, as well as net community production, respiration and gross primary production. The results highlighting the response of Ny-Ålesund plankton community to brownification based on high frequency measurements and other obtained data will be presented in an international symposium and published in open-access journal.



ARCTIC — **Behzad** MOSTAJIR

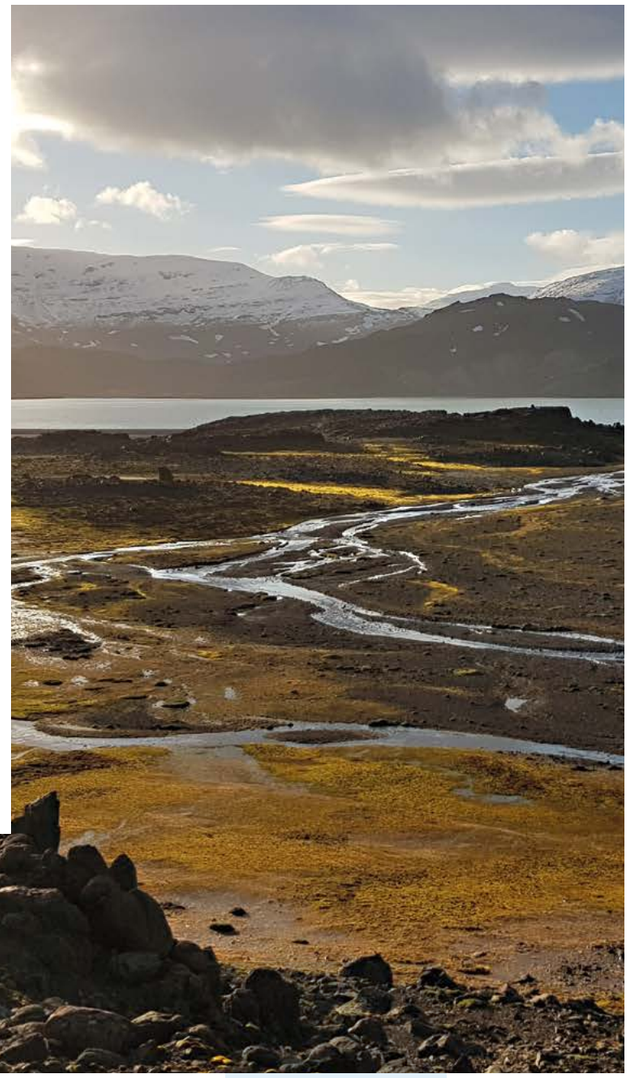
new scientific projects supported in 2020-2021

Earth and Space Sciences

1077 TALISKER

Fluids and magmas transfers across the lithosphere of Kerguelen

Kerguelen corresponds to a unique geodynamic context and geological history, with no current equivalent on Earth, a contemporary analogue of the formation of the first continents 4 billion years ago. The study of the productions, the migrations and the emplacement of differentiated magmas in an oceanic context, the characterization of alteration processes (serpentinization) and mantle fertilization, the respective roles of local (magmatism) and regional (tectonic, deep geodynamics) causes in the structure and evolution of the oceanic plateau as well as the study of the geometry of the different parts of the lithosphere by seismologic and gravimetric approaches and fluids circulations between them allow to provide constraints to clarify the current geodynamics and the scenario of the formation of the first continents on Earth. The current geographical situation is also strategic to constrain the climatic evolution of the last millions of years by studying the dynamics of erosion of the rocks of the archipelago and matter transfers towards the ocean.



SUBANTARCTIC

Damien GUILLAUME

1133 WINDSOC

Westerly winds and the Southern Ocean CO_2 sink

The capacity of the Southern Ocean to absorb anthropogenic CO_2 has recently been limited (according to some studies) by an observed increase in the strength of the Southern Hemisphere Westerly Winds (SHW). These are causing turbulent mixing which is drawing CO_2 saturated waters from the deep ocean back to the surface, causing a net outgassing. This proposed positive climate feedback between winds and CO_2 means that the ocean may no longer function as a net sink of CO_2, driving up atmospheric greenhouse gases and accelerating rates of global warming. Thus, reconstructing past changes (and the range of natural variability), in the strength and position of the SHW, and evaluating whether the SHW have modulated the CO_2 sink in the past, is now a major priority for palaeoclimate science.

Recognising the urgency of this issue, De Vleeschouwer and ECOLAB have instigated a series of projects studying the history of the SHW around the Southern Ocean from changes in atmospheric dust deposition recorded in peat and lake sediments. So far, these records are from the northern-margin of the SHW at Amsterdam Island and Tierra del Fuego (IPEV-funded programmes: PARAD - PI F. De Vleeschouwer; and PALATIO - PI E. Michel/N. van der Putten, ANR JCJC PI FDV). However, there remains a major gap in our understanding of SHW behaviour in their core belt in the higher latitudes of the Southern Indian Ocean sector. This can be addressed by wind reconstructions from subantarctic islands which lie in the core belt of the SHW. Here we propose a sampling programme on the west coast of Ile de la Possession (Crozet Archipelago) which provides a representative site for the Southern Indian Ocean Sector. This will contribute to international initiatives to reconstruct the SHW in the other sectors (Atlantic, Pacific) to gain a better understanding of the zonal behaviour of the winds in their core-belt.

Our research involves analysing radiocarbon-dated peat and lake sediments for past changes in mineral aerosols/dust, and sea salt aerosol flux. We do this using geochemical methods (ITRAX core scanning and ICP-MS) together with novel biological proxies (diatom and testate amoebae), which record changes in salinity from wind-driven sea spray. A recent paper by our collaborators in Nature Geoscience has shown that, combined, these proxies provide reliable, independent, reconstructions of changing wind strength. We are focusing on reconstructing changes through the major transition into the current interglacial (last 15ka) and changes in the last 1000 years; periods associated with major shifts in atmospheric CO_2 concentrations.

By using agreed international analytical protocols, our wind reconstructions will provide a reliable indicator of past SHW around the Southern Ocean that can be compared with records of CO_2 and temperature (in ice cores), and past ocean upwelling (from marine sediment cores). Ultimately, the combined datasets will be compared with Global Climate Model simulations that will help us understand the drivers of past changes in the SHW and atmospheric CO_2.

SUBANTARCTIC

François DE VLEESCHOUWER

1223 KONBHAS

Kongsforden New Benthic Habitats

Since 2009, we are recording and studying the evolution in the context of climate change of the coastal submarine and land morphology in front of 3 alpine glaciers on the south coast of the Kongsfjorden in Svalbard: the Vestre, the Midtre and the Austre Lovenbreen. We focus our study on the transfer from the continental to the marine domains of sediment supplied by the sub glacial rivers and relayed by a channel network to the submarine prodeltas. Thanks to different programs, realised within the AWIPEV framework (Spistbay 2009, the sailing cruises Sonny2011, Seispitz2012 and C3 (2016-2018)), and the PhD work (2016-2018), several questions have been explored. Our main results show that 1) glaciers retreat increases water volume and sediment availability by uncovering large areas and generating a contraction of the drainage pattern, 2) the coastal progradation was dominant from 1966 to 1990 but coastal erosion became predominant since 1990 and increased since 2011, illustrating the end of the transitional paraglacial period in the coastal dynamic of the Brøgger peninsula. On the contrary, in the sublittoral area 3) the prodeltas revealed a huge extension (246,000 m2) from 2009 to 2017. These sediment deposits, together with increased fresh water input, already have been observed to have a visible impact on the benthic algae and fauna. Indeed, in 2017, we detected, by sonar imageries and grab samples, new benthic habitats developing on the submarine prodeltas, such as Laminaria seaweeds fields.

Moreover, ongoing GPS measurements of the Kongsvegen glacier mass balance (J. Kholer, person. comm.) show that this glacier has begun to accelerate (KINGSurge project of UNIS-2018-2020) and reached summer velocities of 18m/yr in 2017, suggesting that a full surge is imminent. The associated new sediment and fresh water supplies expected, together with the intensification of the calving processes, is also expected to deeply modify the new benthic habitats.

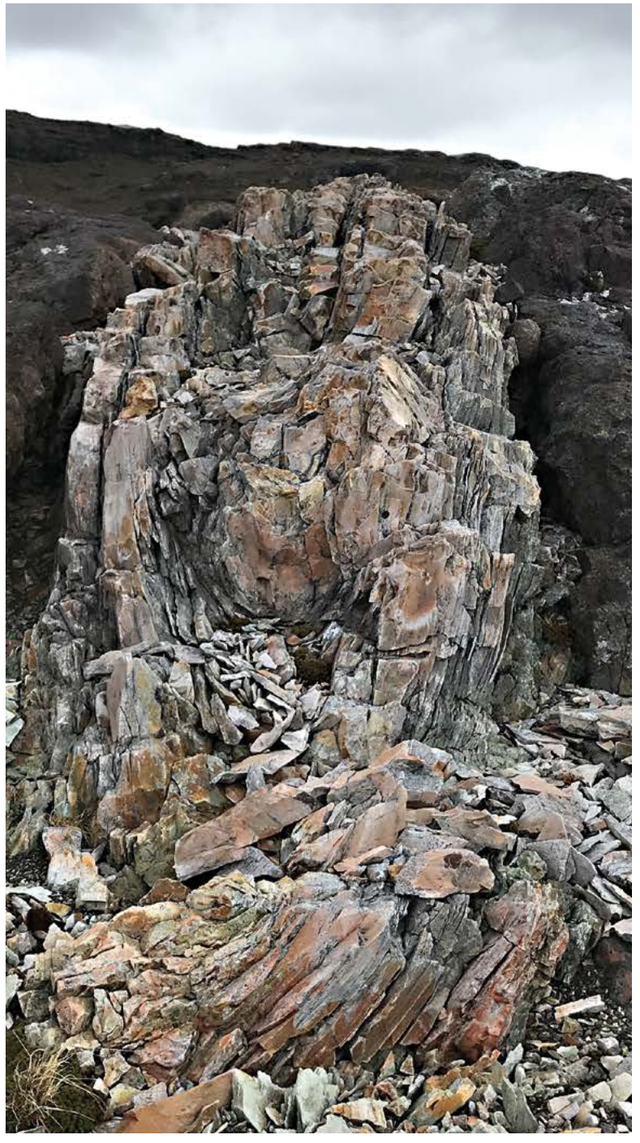
The aim of the KONBHAS project is to follow and record the evolution of these new benthic habitats on the recently deposited sediments of prodeltas, through two complementary approaches: the analyses of sensitive fossilizing biondicators represented by benthic foraminifera and sediment geophysical survey (seismic and side scan sonar). The combination of ecological and sedimentary approaches will be used to follow the physical evolution of the prodeltas and to detect the effect of the different phases of sediment discharge, deposit and stabilization on benthic faunas, at decametric to centimetric spatial scale. The results will allow not only to understand how and how rapidly benthic foraminifera can respond to this kind of environmental pressure but also to calibrate an assemblage-based proxy for historical record of similar events in the past.

ARCTIC

Agnès BALTZER

1239 LISISKER

Study of lithosphere structures and seismicity of Kerguelen



The main goal of the LISISKER (study of lithosphere structures and seismicity of Kerguelen) project is to characterize the structure and the deformation of the Kerguelen lithosphere through the use of seismological and geological data. The LISISKER project corresponds to a multi-disciplinary approach and combines a set of various analysis and interpretation methods, in order to relate geophysical records (in particular from seismology), multiscale geological characterizations and geodynamic models. Large-scale structures of the lithosphere such as the Moho and the privileged areas of fluids and matter transfer over the Kerguelen plume are characterized using the seismic waves from distant earthquakes (study of SKS waves, receiver functions,..). The seismic recordings are interpreted by taking into account petrophysical characterizations carried out on xenoliths brought to the surface by the basaltic flows. These xenoliths, centimetric in size, represent pieces of the deep crust and the lithospheric mantle. Seismic properties of these samples are calculated taking into account petrological, geochemical and crystallographic fabrics characterizations.

The project also aims to characterize the deep dynamics of the lithosphere by locating the seismicity sources near the archipelago. With regard to the current seismic station coverage, the Kerguelen archipelago only currently benefits from the permanent station of the GEOSCOPE seismic network. Then, the deployment of several seismic stations operating on the Kerguelen area will locally improve the instrumental coverage and will complete the seismological network of the Indian Ocean.

SUBANTARCTIC

Jérôme BASCOU

1244 OPTIMISM-SAT

Observing Processes impacting The Sea Ice Mass balance from In Situ Measurements - SATellite validation

The Arctic sea ice is not only an indicator of climate change, it is also a major player in the climate system. So there is a real challenge to improve our forecasting capabilities. Climate models agree that Arctic summer pack ice may disappear, but observations indicate that this is occurring at a rate substantially faster than that of simulations, despite the progress made over the last years. There are also wide disparities between the models. Documenting and analyzing processes of exchange (heat, fresh water, momentum) at the ocean-ice-atmosphere interface in the Arctic is therefore particularly important to better understand the evolution of the ice pack on the one hand, but also to better parameterize these exchanges to improve the predictive capability of climate models. Some processes are not yet taken into account by climate models such as the ability of swells propagating from the marginal ice zone (MIZ) to fracture an increasingly thin and fragile ice pack, and in doing so to affect ocean-ice ocean-atmosphere heat flux.

Perhaps more so than the detailed representation of processes, the lack of an accurate knowledge of the very background state of the ice pack (the current ice volume) is being pointed out as a major hindrance for accurate climate prediction. Precise measurement of ice thickness from space is therefore a key issue. While constantly improving, the remote sensing of ice thickness struggles in reducing uncertainties inherent to the method, which is based on freeboard measurement (chiefly uncertainties in snow load and ice density). In this context, the acquisition of in situ observations in the Arctic sea ice is a major need. These are critical not only to analyze and understand the processes involved, to ultimately improve their parameterization in climate models, but they also remain crucial for validating satellite observations (for Ku-band radar altimetry and L-band radiometry missions in particular).

The acquisition of year-round in situ measurements in such inhospitable regions requires autonomous vectors. We have developed an autonomous buoy 'Ice-T' (for 'Ice Thickness') dedicated to the study of the ice mass balance. The buoy provides as well real-time transmitted heave spectra measurements in sea ice. This project aims to pursue the acquisition of an uninterrupted time series of observations initiated in 2011 along the transpolar drift, between the North Pole, where the buoy is deployed, and Fram strait and beyond as the buoy often continues its drift in the MIZ along Greenland.

New technological developments are envisioned here: (1) the inclusion of a miniature radar for direct snow height measurement, a poorly known parameter and a major source of error for the remote sensing of ice thickness; (2) In addition we plan to include salinity measurements in the sea ice, in particular at the snow-ice interface, observations which could be important for improving freeboard measurements in the Ku-band frequency, as the presence of saline snow layer impacts the location of the main radar scattering horizon. The observations that we propose to acquire will be used both to validate satellite observations and to investigate a variety of processes at the ocean-ice-atmosphere interface.

ARCTIC

Frédéric VIVIER

new scientific projects supported in 2020-2021

Human Biology

1199 PAHPA ICE

Physical Activity and Health, Pluridisciplinarity Approach in ICE (isolated, confined environment) (PAHPA ICE)

This program convene several disciplinary fields to understand the human adaptation to hostile environment. This applied research addresses this problem from physiological, cognitive and psychological sciences standpoints. It is expected that all these fields will provide convergent information about the changes occurring during wintering. The final outcome of this project is to put forward concrete answers to the variations observed.

With regard to the existing literature, an inventory of physiological, psychological and cognitive data in hostile environments should confirm the evolution of the changes during wintering on the psychological, cognitive and physiological behaviours. The understanding of physiological, cognitive and psychological variability during the wintering could lead us in a second step, which is to propose concrete solutions, such as a physical activity program, to improve health as a whole.

ANTARCTIC

Aude VILLEMAIN

1232 COG-IPEV-TAAF

A study of cognitive coping mechanisms while wintering in winterers in the French Australs and Antarctic Territories

The objective of this study is to investigate the coping mechanisms of cognitive functions in winterers during wintering in the three Austral districts: Crozet, Kerguelen and Amsterdam of the French Austral and Antarctic Territories.

During wintering period from March to November, winterers are subject to extreme environment conditions which may entail coping difficulties that have been investigated from a psychological perspective, i.e. essentially affective: anxiety, mood disorders and/or behavior distrubances.

Conversely, possible difficulties in cognitive coping (i.e. essentially intellectual capabilities of information management, communication, planification and implementation) have not been investigated by the using up to date evaluation tools.

This study will be conducted in a population of Civil Service Servants (VSC) and Wildlife Sanctuary Agents. Baseline parameters (test, baseline) will be measured during landing in OP4 year N. Retest (observed values during wintering) will be conducted during OP2 year N+1. A total sample of 30 subjects is expected.

Each subject will be his own reference for retest values. Study results will be communicated to the volunteers who will ask for them.

This study, of which results can be extrapolated to many isolation situations in professional settings, shall allow to implement early detection tools of warning and tools to help winterers at high risk of developing a "Wintering mental syndrome". It should also permit to update the selection criteria of winterers in order to minimize this risk.

SUBANTARCTIC

Philippe AZOUVI
Marc SINDRES

new scientific projects supported in 2020-2021

Humanities and social Sciences

1237 HABIT-ANT ?

Habiter l'Antarctique ? Preliminary study: anthropological analysis and Participative Action Research

This project aims to study the feasibility of multi-disciplinary and interdisciplinary research at the heart of the polar activities in the Southern and Antarctic Lands and Seas. The question "How are protected spaces and places inhabited?" is raised using a dialogue between the environmental sciences, the general anthropology and the Participatory Action Research methodology designed for engaged inquiry.

HABIT-ANT? pilot study, is the first phase of a project that questions the notion of inhabitat in Antarctica. This question is grounded on an important paradox that naturally finds its place in the contemporary preoccupations surrounding Antarctica: to be physically present in a space is a unique and irreplaceable experience, moreover, to make a place exist can happen very differently, by thought, memory, imagination or intuition.

The HABIT-ANT? pilot study is to be deployed in East Antarctica in the form of an anthropological exploration centered on different sites and presenting a past or current human presence. On this occasion, Participatory Action Research (PAR) experiments will be conducted both on the site and far from Antarctica, involving different stakeolders involved in Antarctica through their work or personal interest. The output of the project is to carry out the first anthropological exploration ever on a French Antarctic base.

The second pilot result is to create an interdisciplinary study group with different stakeholders in Antarctica, based on the values of the Antarctic Treaty System and able to address the question "How are protected or to protected spaces and places inhabited?". The hypothesis is that singularity of Antarctica imposes a particular treatment that can feed the reflection on other sites facing similar issues.

ANTARCTIC **Emmanuelle** SULTAN

1238 ESBA

Ethnography of a Scientific Base in Antarctica

Our project focuses on the processes of structuring social life and on the constitution of a specific culture, that of a relatively isolated microsociety of actors. It seeks to define the forms of sociality and culture engendered, that is to say the nature of the relationships that individuals weave together, in a particular situation.

This multidisciplinary project combines the skills of anthropology, history, cognitive psychology and information and communication sciences. Its originality is to try to analyze how to "make society" for actors in small numbers and relatively isolated from the rest of the world. In the context of the perception of the space and the very particular time implied by rare communications with the outside, and probably rapidly ritualized communications between these actors, the group of these gradually builds its identity through a set of rituals, whose rites concerning commensality are not the least.

To this end, we will study in a very concrete way various aspects of everyday situations: meal periods, festive moments, episodic contacts with colleagues, friends and family that give rise to postures and communications whose forms and contents have important specificities. These impact the perceptions of time and space by the actors, as well as their power relations other than those of the institutionalized hierarchy.

Only a fine ethnography will show if these actors "make" society and in what form, as well as the possible future of such a society after the mission. This last item will be dealt with as follows:
- interviews immediately after the mission
- interviews with former researchers who spent time on the base
- a comparative approach between different bases. We plan to compare the experiences of researchers on American, British, German or Italian bases.

The project will be implemented on the basis of Dumont d'Urville et Kerguelen Islands. The methodology used will be that of participant observation in situ of a researcher, during 2 months, at the beginning of the campaign, and 1 month at the end of the campaign each year, during the first 2 years. The third year will be devoted to the writing of the report.

The concrete applications of this research will be twofold:
- On the one hand, we wish to contribute to the structure IPEV by providing elements relating to daily life and the identity building processes, that will enable it to better identify, solve and anticipate certain problems related to the long-term cohabitation of people from different social and/or cultural backgrounds.

- The concrete applications of this research could also affect the organization of long-term space flights expected to develop in the future, such as underwater explorations at great depths conducted by small groups, and for short periods of time. In caissons pressurized for this purpose, or situations of cohabitation suffered, as in the case of displacement of populations, or in the case of cohabitation of groups of diverse origins in large urban areas...

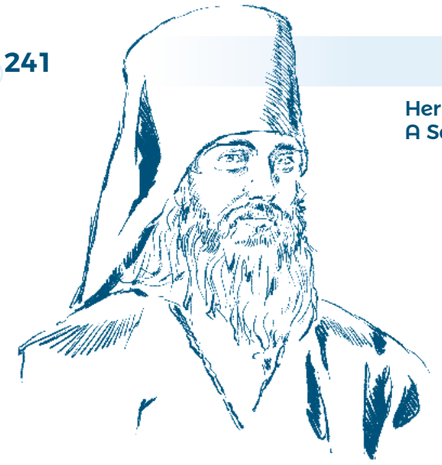
Beyond the purely technical problems posed by these types of experiments, these are important human problems that arise acutely on these occasion.

ANTARCTIC **Isabelle** BIANQUIS

1241

HERMAN

Herman of Alaska.
A Saint at the Heart of Multiple Claims



This project develops further one aspect of the previous IPEV program entitled “Orthodox Christianity and Indigenous People in Contemporary Alaska and Chukotka” (OCIP, 2015-2018). It aims to document ethnographically and analyze anthropologically the ways in which Orthodox actors at various scales (local, national, transnational) make claims with reference to the figure of Saint Herman of Alaska. The monk Herman (1751 or 1760 to1836 or 1837) was one of the first Russian Orthodox missionaries sent by Empress Catherine II to Alaska in 1794. Canonized in 1970, Saint Herman is a central figure in Alaskan and North American Orthodox Christianity: he is regarded both as the patron saint of Orthodox Christians in America and the protector of Alaskan indigenous people. Recently, a new interest in Herman has emerged in Russia, where he is presented as the “baptizer”, exemplifying the missionary role of the Russian Orthodox Church. Thus, Herman is a saint deeply rooted locally, in Alaska, but he also displays international dimensions. To facilitate understanding of his significance from all relevant points of view, research will be conducted in Alaska and in Russia. Funding is requested for two field studies (in Kodiak and in the Karelia region); a third field study will be done with another source of funding. Research will be conducted by two anthropologists with complementary expertise and field experience: M.-A. Salabelle and V. Vaté. First, in August 2020, both Salabelle and Vaté will document the celebration of the 50th anniversary of the canonization of Saint Herman during the pilgrimage devoted to him every year in the Kodiak region, usually from 7 to 9 August. Research in Russia will be aimed at investigating the ways in which representatives of the Russian Orthodox Church are integrating the history of Herman of Alaska into its practices of veneration, in particular by constructing churches and chapels devoted to the saint. For this, two fieldsites have been chosen: Kadom/Riazan Region (in March 2021) - where Saint Herman was born and grew up - and Valaam monastery/Karelia region (in August 2021) - where Herman lived before he was sent to Alaska. Both Salabelle and Vaté will conduct research in Valaam monastery. Vaté’s fieldwork in the Riazan region will take place and be funded in the framework of the project “Marking the space with the religious” (2019-2021, FMSH/RFBR). The results of the three fieldwork campaigns will be integrated into a book in progress by Vaté and Salabelle, entitled, tentatively, Herman’s Contested Heritage.

ARCTIC

Virginie VATÉ-KLEIN

ALL SCIENTIFIC
PROJECTS
in 2020-2021

82
SCIENTIFIC PROJECTS SUPPORTED BY THE FRENCH POLAR INSTITUTE

71
PROJECTS ACCEPTED BY THE CPST

37
completed in the field

36
carried over to the 2021-2022 campaign

2 OTHERS

8 ESA PROJECTS

1 EUROPEAN PROJECT

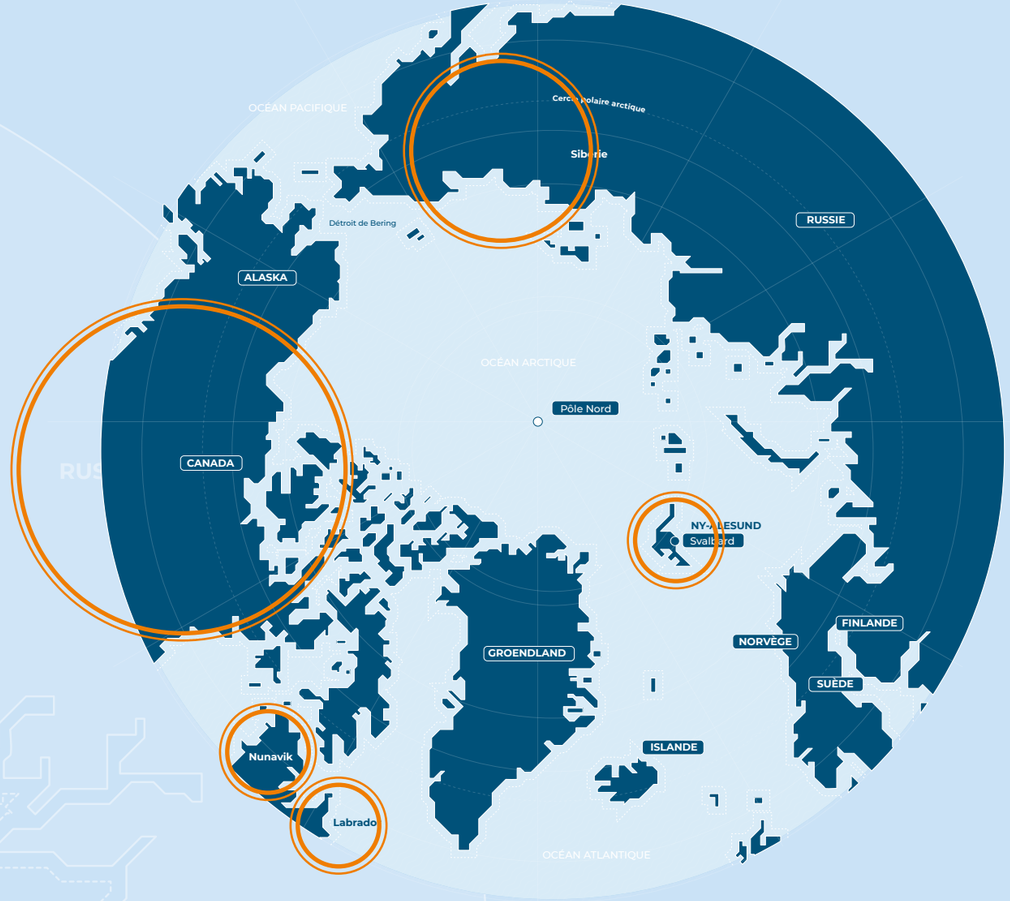
ALL SCIENTIFIC PROJECTS SUPPORTED IN ARCTIC

LIFE SCIENCE

330	**ORNITHO-ENDOCRINO**	*Contaminants exposure and maternal effects in arctic seabirds*
333	**PARASITO ARCTIQUE**	*Host-parasite interactions and demography in space: dispersal and local interactions in arctic seabirds.*
388	**ADACLIM**	*Responses of Arctic marine birds to environmental constraints in the context of climate change*
1036	**INTERACTIONS**	*Direct and indirect impacts of different parasite-predator-prey interactions on the cyclic dynamics of an Arctic terrestrial vertebrate community subject to climate change*
1190	**MAD FOOD 2**	*Fate of MAcroalgae Detritus as FOOD sources in polar coastal ecosystems. Phase 2*
1192	**MICROLIFE 2**	*Microorganisms living in the Arctic*
1218	**HyperGeese**	*Hyper-abundant arctic-nesting geese and the decline of Canadian arctic-nesting shorebirds, an empirical test*
1233	**ICAR**	*Impact of global Change on Arctic Rodent communities*
1240	**Ny-Ålesund-Plankton**	*Study of Ny-Ålesund plankton community responses to brownification by using high frequency data of autonomous sensors and by conventional measurements during an in situ mesocosm experiment*

EARTH AND SPACE SCIENCES

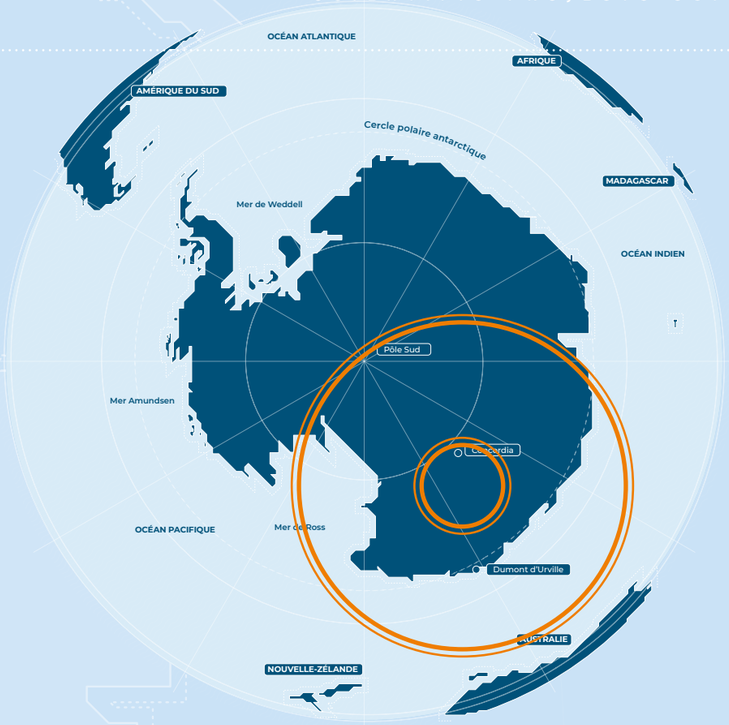
1026	**POLARLIS 3**	*POLArisation of the thermospheric Red Line In Svalbard*
1042	**ESCAPE-Arctic 3**	*Ecosystems - Snow - ClimAte - PErmafrost feedbacks - 3*
1108	**ALSI**	*Austre Lovénbreen - Snow and Ice*
1126	**ARCSNOW-2**	*Long-term interactions between snow and the atmosphere in the Arctic - 2*
1180	**EGRIP-France**	*Ice drilling in Greenland EGRIP - FRANCE*
1206	**INTAROS-SVALBARD**	*Contributing to an INTegrated ARtic Observation System around SVALBARD*
1215	**ALPACA**	*ALaskan Pollution Arctic Chemistry-climate Analysis*
1223	**KONBHAS**	*Kongsforden New Benthic Habitats*
1224	**(MPC)2**	*Microphysical Process Characterization of Mixed Phase Clouds in the European arctic*
1227	**PIM**	*Participation of IAOOS in MOSAIC*
1244	**OPTIMISM-SAT**	*Observing Processes impacting The Sea Ice Mass balance from In Situ Measurements - SATellite validation*



HUMANITIES AND SOCIAL SCIENCES

1038	**PALAEOMICSI**	*Unveiling the biological consequences of population contact and resulting changes in lifestyle in north East Siberia : An archaeological, Palaeogenomic, epiproteomic and microbial approach*
1080	**ENCHAINEC**	*Environmental Changes and Human Activity In North Eastern Canada (Nunavik and Labrador) during the Last Millenium*
1127	**BRISK's OBS ENV**	*OBServatories for BRidging Indigenous and Scientific Knowledge about ENVironmental Changes in the Arctic: Adaptation and Vulnerabilities of the Environment and Related Societies*
1148	**DeSiGN**	*Dynamic Slope Geomorphology and vulnerability in Nunavik, Canada*
1213	**IMob-Ed**	*Inuit Mobilty and Education*
1217	**palethnoAK**	*Palethnological approach to prehistoric hunter-gatherers from the Alaskan boreal forest*
1241	**HERMAN**	*Herman of Alaska. A Saint at the Heart of Multiple Claims*

ALL SCIENTIFIC PROJECTS SUPPORTED IN ANTARCTIC



LIFE SCIENCE

1091	**I'AMMER**	*Adelie penguins as Monitor of the Marine EnviRonment*
1182	**ASSET**	*Antarctic Seals and the Sea-ice EnvironmenT (ASSET)*

EARTH AND SPACE SCIENCES

411	**GLACIOCLIM-SAMBA**	*The glaciers, an observatory of climate, Antarctic component*
414	**CESOA**	*Atmospheric Sulfur Cycle in relation with climate at mid and high Southern latitudes*
694	**SURVOSTRAL**	*Monitoring the Southern Ocean*
910	**HAMSTRAD**	*H2O Antarctica Microwave Stratospheric and Tropospheric Radiometers*
1013	**CALVA**	*In situ data for the calibration and validation of meteorological and climate models and satellite remote sensing, from the coast of Adelie Land to Dome C.*
1053	**DACOTA**	*Dynamics of coastal outlet glaciers and implications on the overall mass balance of the East Antarctic ice sheet*
1066	**ASTEP+**	*ASTEP+ : Antarctic SouThErn Photometry telescope*
1110	**NIVO**	*Snow properties evolution in a changing climate in Antarctica*
1112	**CHINSTRAP**	*Continuous High-altitude Investigation of Neutron Spectra for Terrestrial Radiation Antarctic Project*
1169	**EAIIST**	*East Antarctic International Ice Sheet Traverse*
1177	**CAPOXI 35-75**	*Oxidizing capacity of the atmosphere 35-75 °S*
1202	**BE-OI**	*Beyond EPICA: Oldest Ice (reconnaissance phase)*
1203	**ARCHIVE EPICA**	*Management of the EPICA-DC ice core stored at Concordia*
1214	**SEIS-ADELICE**	*Seismic Monitoring of Ice Dynamics in Terre Adélie, East-Antarctica*

HUMANITIES AND SOCIAL SCIENCES

1237	**HABIT-ANT ?**	*Habiter l'Antarctique ? Preliminary study: anthropological analysis and Participative Action Research*
1238	**ESBA**	*Ethnography of a Scientific Base in Antarctica*

HUMAN BIOLOGY

1199	**PAHPA ICE**	*Physical Activity and Health, Pluridisciplinarity Approach in ICE (isolated, confined environment) (PAHPA ICE)*
1220	**SLEEPCOUNT**	*Sleep and neurocognitive disturbances: Countermeasures and innovative investigation tools under polar extreme conditions in Antarctica*

ESA

991701	**ANTARCV**	*Alterations in total red blood cell volume and plasma volume during a one-year confinement in Antarctica : effect of hypoxia*
991706	**MINDFUL-ICE**	*The role of mindfulness disposition in an isolated and confined environment*
991708	**CHOICE III**	*Consequences of longterm-Confinement and Hypobaric HypOxia on Immunity in the Antarctic Concordia Environment (CHO2ICE III – Study): Learning from the Vulnerability of Adaptation to the Benefit of Space Exploration*
991720	**SWICE**	*Human Sexual Wellbeing & Sexual Security in Isolation & Confinement*
991723	**HINE**	*Hypobaric intermittent normoxic exercise (HINE)*
991725	**ICELAND-TWO**	*A counter measure for the effects of Immune and Microbiome Changes in Environments with Limited ANtigen Diversity (ICELAND-TWO)*

OTHERS

990000	**BIOMED**
990001	**MICERA**

UNIVERS

990020	**Beyond EPICA**

ALL SCIENTIFIC PROJECTS SUPPORTED IN ANTARCTIC SUBANTARCTIC

EARTH AND SPACE SCIENCES

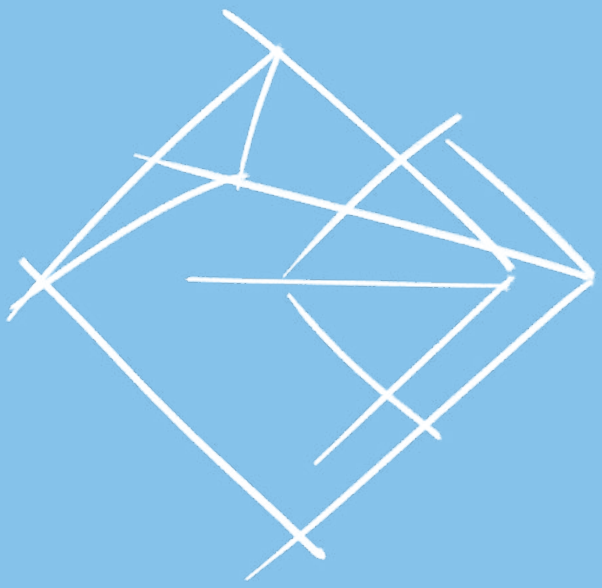
133	**SISMOLOGIE/OBS**	Antarctic, Subantarctic	*GEOSCOPE - EOST : Global Seismological Observatory*
139	**GEOMAGNETISM/OBS**	Antarctic, Subantarctic	*BCMT-EOST: the Five French magnetic observatories in Austral territories and Antarctica (AMS, CZT, DMC, DRV & PAF)*
209	**NDACC Antarctica**	Antarctic, Subantarctic	*NDACC Antarctica*
227	**RAYCO**	Antarctic, Subantarctic	*Observation of the nucleonic cosmic ray component*
312	**SuperDARN KER**	Subantarctic	*SuperDARN Kerguelen*
416	**SNO-AMS / ICOS-France**	Subantarctic	*Greenhouse gases monitoring at Amsterdam Island*
688	**NIVMER**	Antarctic, Subantarctic	*NIVMER*
1028	**GMOSTRAL 3**	Antarctic, Subantarctic	*Global Mercury Observations: atmospheric monitoring and process studies in Sub-AnTarctic Regions and Antarctic Lands 3*
1077	**TALISKER**	Subantarctic	*Fluids and magmas transfers across the lithosphere of Kerguelen*
1133	**WINDSOC**	Subantarctic	*Westerly winds and the Southern Ocean CO_2 sink*
1165	**AERONET**	Subantarctic	*Aerosol Monitoring using sun photometer at Amsterdam Island (AERONET/PHOTONS station)*
1200	**EnviKer**	Subantarctic	*Characterization and monitoring of environments and paleoenvironments from Kerguelen using testate amoebae*
1205	**ADELISE**	Antarctic, Subantarctic	*To better constrain the origin of surface accumulation and recent climate change in Terre Adélie via the contribution of water isotopes (ADELISE)*
1239	**LISISKER**	Subantarctic	*Study of lithosphere structures and seismicity of Kerguelen*

HUMAN BIOLOGY

1232	**COG-IPEV-TAAF**	Subantarctic	*A study of cognitive coping mechanisms while wintering in winterers in the French Australs and Antarctic Territories*

LIFE SCIENCE

109	**ORNITHOECO**	Antarctic, Subantarctic	*Seabirds and marine mammals as sentinels of global changes in the Southern Ocean*
119	**ECONERGY**	Subantarctic	*Interactions between extrinsic and intrinsic factors in shaping offspring growth and adult phenotype: determinants of individual quality in the king penguin?*
131	**PHYSIONERGY**	Subantarctic	*Energetic challenges in penguins: Physiological, Bioenergetics and molecular Adjustments*
136	**SUBANTECO**	Subantarctic	*Subantarctic biodiversity, effects of climate change and biological invasions on terrestrial biota*
137	**ECOPHY - ANTAVIA**	Antarctic, Subantarctic	*Adaptive strategies and population dynamics of polar seabirds under environmental constraints*
354	**ETHOTAAF**	Subantarctic	*Behavioural ecology of subantarctic birds*
394	**OISEAUX PLONGEURS**	Subantarctic	*Foraging Ecology and Energetic of Southern Diving Predators in Relation to Climatic Variability*
1044	**PROTEKER**	Subantarctic	*Effects of global change on coastal marine habitats of the Kerguelen Islands. Establishment of a base line for ecological and genetic monitoring, protection and conservation*
1151	**ECOPATH**	Subantarctic	*Circulation of directly transmitted and tick-borne infectious agents in sub-Antarctic and Antarctic colonial vertebrate populations: surveillance, understanding and management implications*
1201	**CYCLELEPH**	Subantarctic	*Life cycle of Southern Elephant seals: energetic, physiological and behavioural adaptations to environmental constraints*



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