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Etienne Bustarret, Éric Guilyardi, Magali Jacquier, Christine Noiville, Comité Ethique

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COMETS
CNRS Ethics Committee

OPINION no. 2023-45

« Opportunity-driven campaigns : Ethical partnerships for scientific research ? »

Approved at the plenary session of 14 September 2023

RAPPORTEURS :

Etienne Bustarret
Eric Guilyardi
Magali Jacquier
Christine Noiville

I. SUMMARY

COMETS was asked by the CNRS Chairman and CEO to make recommendations on the ethical conditions under which CNRS research staff may participate in '**opportunity-driven campaigns**' whereby they **take advantage of public or private logistical resources not originally designed for research purposes—such as airliners or naval, commercial, cruise or pleasure vessels—in order to take aboard instruments to collect scientific data or go aboard themselves to conduct research projects.**

This internal request comes after the CNRS was publicly questioned by the French branch of Scientist Rebellion about a particular type of opportunity-driven campaign offered by Compagnie du Ponant, a tour operator that organises cruises to polar regions while using the onboard presence of researchers conducting research projects as a marketing argument for its customers. This passenger-funded model, which reinvents the traditional idea of an opportunity-driven campaign, is part of a more general movement initiated by tourist industry players that offer trips to 'unique' or difficult-to-reach locations such as the polar regions or lagoons.

In this Opinion, COMETS considers these examples in the context of a comprehensive analysis of such opportunity-driven campaigns, taking into account all the dimensions involved (advancing knowledge, impact on the environment and populations, private funding of research, etc.). It believes that, generally speaking, it would be a pity to deprive research of the scientific data that such opportunities can undeniably provide. However, it considers that they can become problematic when they are an accessory to tourism that has a negative impact on the environment and, even more so, when they are used as an argument to endorse or even promote such tourism.

This is why COMETS recommends that, when research contracts are offered alongside tourist activities in vulnerable areas (such as polar regions, protected areas, lagoons, the ocean depths, space, etc.), particular care should be taken to balance the research campaign's scientific contribution against the environmental and socio-cultural impact of the activity to which it is linked, as well as its repercussions on the image of the CNRS and research more generally.

In this respect, COMETS has serious reservations about the opportunity-driven campaigns currently offered by Compagnie du Ponant aboard the icebreaking cruise ship *Le Commandant Charcot* in the Arctic and Antarctic. Compared with other polar tour operators, this company undoubtedly has a relatively virtuous approach to environmental issues and offers the researchers it hosts fair contracts. However, these field campaigns are of limited scientific interest while impacting the environment and human societies. At the same time, the presence of scientists on board is used as a promotional argument for polar tourism, an activity that is even more ethically questionable given that it is developing on an unprecedented scale and putting these regions under increasing pressure.

Rather than letting research staff decide for themselves whether or not to enter into this type of partnership, and allowing regional delegations to negotiate these contracts on an *ad hoc* basis, COMETS recommends that the CNRS adopt:

- a clear public stance on the acceptability criteria for this kind of opportunity-driven research campaign and indeed other partnerships with companies and foundations; COMETS believes that the scientific benefit of the campaign, its environmental, social and cultural impact, and its repercussions on the image of research in general and the CNRS in particular should systematically be taken into account; this position should clearly identify the ‘red lines’ not to be crossed, and update them periodically in response to the ever-changing range of opportunities on offer;

- a framework applicable to those opportunity-driven campaigns that will ultimately be considered acceptable; this framework should in particular ensure that they are conducted with due respect for the best interests of science, with the research thus carried out remaining independent and impartial, and in keeping with the professional responsibilities of research staff. In particular, the following points should be observed: the rules governing the holding of multiple positions; a scientific project that is clear, of high quality and that undergoes peer review; a clear demonstration that the opportunity-driven campaign will provide data of use to the proposed project; a detailed campaign report; an ex-post evaluation of the project; the CNRS must own the results and data collected; the private operator must not be able to hinder publication or unrestricted access to the results; lastly, particular attention must be paid to the reusability of the datasets collected for other research (the principles of open science encourage research data to be ‘reusable’, which is particularly desirable when they have been obtained in fragile environments, in order to avoid duplicating research campaigns).

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II. FORMAL INTERNAL REQUEST

(Please see the following page for the English translation).

cnrs

Le Président-directeur général

PRES-D-2022-147

Madame Christine Noiville
Présidente du COMETS
Comité d'éthique du CNRS
3, rue Michel-Ange
75794 Paris cedex 16

Paris, le 22 Novembre 2022

Madame la Présidente du COMETS,
Mesdames et Messieurs les membres du comité d'éthique du CNRS,

Dans le cadre labélisé et selon des règles connues et énoncées, le CNRS autorise des équipes à profiter, pour mener un projet de recherche, de moyens privés par l'instrumentation de bateaux ou d'avions de ligne.

Ces dispositifs, appelés « campagnes d'opportunité », doivent en principe être justifiés par un projet scientifique clair, dans un cadre balisé et dont la réalisation doit respecter les valeurs du CNRS et des règles exprimées dans une convention en particulier, déontologie scientifique, indépendance de la recherche, établissement d'un rapport de campagne, propriété et ouverture des résultats…

Mais ces dispositifs peuvent aussi conduire à des questions légitimes sur le rôle « d'alibi » que peuvent endosser les scientifiques. Par exemple, des croisières touristiques en Antarctique doivent-elle être organisées sous prétexte qu'elles comportent un volet scientifique ?

Je remercie le COMETS de formuler des recommandations sur les conditions dans lesquelles il convient de poursuivre ces campagnes et la meilleure manière de les encadrer.

Avec tous mes remerciements,

Antoine PETIT

CNRS
Campus Gérard Mégie
3, rue Michel-Ange
75794 Paris cedex 16
T. 01 44 96 40 00
www.cnrs.fr

Chairman and CEO

PRES-0-2022-147

Ms Christine Noiville
COMETS chair,
CNRS Ethics Committee
3 rue Michel-Ange
FR-75794 Paris cedex 16

Paris, 22nd November 2022

Dear COMETS chair,
and members of the CNRS Ethics Committee,

Within an established framework, and in accordance with known and clearly stated rules, the CNRS authorises teams to take advantage of privately-owned resources to carry out research projects by adding instruments to ships or airliners.

In principle, these 'opportunity-driven campaigns' must be justified by a clear scientific project within a defined framework. They must also be conducted in compliance with CNRS values and rules, expressed through an agreement that in particular takes into account factors such as ethics and scientific integrity, the independence of research, the drafting of a campaign report, and the CNRS's ownership of and open access to data and results.

Such campaigns may also lead to legitimate questions on the role of 'alibi' that participating scientists may play. For example, should tourist cruises to Antarctica be organised on the grounds that they have a scientific component?

I would like COMETS to make recommendations on the conditions under which such campaigns could be pursued and the best way of managing them.

Many thanks,

Antoine Petit

CNRS
Campus Gérard Mégie
3, rue Michel-Ange
FR-75794 Paris cedex 16
Tel. +33 144 96 40 00
https://www.cnrs.fr/en

III. OPINION

A. THE QUESTION

COMETS was asked by the CNRS Chairman and CEO to make recommendations on the ethical conditions under which CNRS research staff may participate in 'opportunity-driven[1] campaigns' whereby they take advantage of public or private logistical resources not originally designed for research purposes—such as airliners or naval, commercial, cruise or pleasure vessels—in order to take aboard instruments to collect scientific data or go aboard themselves to conduct research projects.

This internal request comes after the CNRS was questioned by the French branch of Scientist Rebellion about a particular type of opportunity-driven campaign offered by Compagnie du Ponant, a French cruise company[2]. Since 2021, this company has been offering scientists, selected by an independent scientific committee, the opportunity to travel to the Arctic Ocean or around the Antarctic aboard *Le Commandant Charcot*, an icebreaking cruise ship outfitted with a few research facilities[3]. At the time of writing, several dozen scientists of various nationalities have boarded this 'vessel of opportunity', including researchers from the CNRS, Ifremer and the École Pratique des Hautes Études (EPHE-PSL, a French higher education and research institution). Some have studied ocean pollution, others the role of melting glaciers in rising sea levels, or changes in oxygen levels in the ocean, by taking samples *in situ*, deploying Argo floats, or collecting nanoplastics, and so on[4]. Compagnie du Ponant has announced that for 2024 it will also be organising "a science-led cruise", with 22 scientists on board[5].

The CNRS was called upon to question the relevance of such campaigns, which are "financed by private tourism operators" and which, "under the guise of supporting science", are in fact contributing to the "commercialisation of the poles"[6]. The wording of the internal request to COMETS does not mention any operator in particular, but it does raise the question of the possible 'alibi' provided by scientists who, by boarding such vessels of opportunity, endorse tourist cruises on the grounds that they include a scientific component.

This question is being posed against a background where support for public research by private foundations or companies is giving rise to renewed concerns among some research staff[7]. Although it

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[1] *The term 'opportunity' hereinafter refers to an occasion or set of circumstances that make it possible to do something.*
[2] *Open letter from the French branch of Scientist Rebellion to C. Noiville, the COMETS Chair; N. Arnaud, Director of INSU, the CNRS National Institute for Earth Sciences and Astronomy; and A. Schuhl, Deputy Science Director and Chair of the CNRS Sustainable Development Committee, 17 October 2022. Compagnie du Ponant is controlled by the Artémis holding.*
[3] Le Commandant Charcot *has two laboratories (one dry, one wet), sonars, marker buoys, a salinograph, a drone, etc.*
[4] *By late 2022, some 60 scientists had already boarded* Le Commandant Charcot *since it was commissioned, and 43 research projects had been validated for the 2023 season.*
[5] *https://www.youtube.com/watch?v=hrJH3ubWBuY&t=1446s*
[6] *Open letter from the French branch of Scientist Rebellion dated 17 October 2022. Similarly: "Ce paquebot de luxe, qui embarque des chercheurs pour étudier les pôles, divise les scientifiques" [This luxury liner, which takes researchers on board to study the poles, is dividing scientists"], Ouest France, 12 May 2023.*
[7] *See COMETS Opinion no. 1996-03 on this 'conventional' question concerning scientific research and private fund-raising. With respect to how this question is coming back into the spotlight today, see the Opinion of the French National Commission for Ethics and Alerts in Public Health and the Environment (cnDAspe) on "L'indépendance de la recherche et de l'expertise dans les contextes de relations public-privé intéressant les domaines de la santé et de l'environnement" [The independence of*

may be beneficial to supplement the public research budget with private funding, particularly for projects lacking sufficient resources, a number of questions need to be asked about the risks that such support may entail: the risk of research being misused as a showcase, or even to justify or give free rein[8] to companies with unsustainable practices (i.e. greenwashing); the risk of strategies of influence undermining the independence of researchers; the risk to the image of public research and to the sense of purpose among staff working to limit the environmental crisis; and the risk of government disengagement in the light of growing private-sector investment in public research.

This being so, COMETS has considered the ethics of opportunity-driven campaigns, especially those taking place in fragile ecosystems such as the polar regions[9].

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research and expert appraisals in the context of public-private relations in the fields of health and the environment], to be published (in French) in 2023 at https://www.alerte-sante-environnement-deontologie.fr; the theme day in Montpellier on 27 October 2022 held by the French Society for Ecology and Evolution (SFE²) addressing the ethics behind the funding of research in ecology and evolution; the interdisciplinary day held by CNRS's "Oceans and Seas" research group (OMER) on research-business interactions, 27 January 2023. See also: the formation of the Sphinx association and the group "Polytechnique is not for sale!", which led the Total and LVMH groups to abandon their plans to locate their research centres on the Plateau de Saclay campus where the École Polytechnique engineering school is already situated; the French branch of Scientist Rebellion, which asked the members of the BNP Paribas Board of Directors to put an end to its "Climate and biodiversity initiative" sponsorship programme; the controversies surrounding the joint public and private funding of various programmes due to the participation of funders with little regard for their environmental impact, including the Polar Pod project (an oceanographic vessel designed by explorer Jean-Louis Étienne that was intended to explore the Southern Ocean by 2024) and the Esprit de Velox project (a sailing vessel for scientific research designed to explore the oceans, launched in 2014 by navigator and engineer François Frey).

[8] A prohibited commercial activity, for example, may be authorised if its purpose becomes scientific. Indeed, this is the case for whaling in the whale sanctuaries of the Southern and Indian Oceans.

[9] A fragile environment is an ecosystem made up of rare plant and/or animal species, along with a substrate such as the seabed or coral, whose time constants (symbiotic exchanges/initial formation/regeneration following disturbance) are long in relation to the scale and speed of a potential human impact. This definition applies whether or not access to it is regulated.

B. ANALYSIS

1. COMETS would first like to stress that opportunity-driven campaigns are a traditional type of partnership in the world of public research. Even though the often informal nature of the conditions and terms under which they are carried out makes it impossible to draw up a precise typology and analysis, there are many examples of private or public ships, satellites or aircraft that have long assisted research by taking scientists and/or instruments on board[10]. For atmospheric research, ozone detectors and weather stations are carried by airliners to measure chemicals and aerosols, collect weather data and monitor climate change[11]. In the space sector, it is also standard practice to include research instruments like microsatellites as launcher payloads. Similarly, numerous opportunity-driven ocean observation campaigns have been carried out since the 1980s. While most of these stem from informal links forged between scientists and either private or public players (companies, associations, government departments), some are developing on a more systematic basis. This is the case, for example, with the World Meteorological Organization and the French Institute for Ocean Science (Ifremer). Indeed, Ifremer takes advantage of offshore races organised by the International Monohull Open Class Association (IMOCA), or ships belonging to the French Navy or merchant navy[12]. These vessels of opportunity can be used to track marine animals, collect microplastics and measure the ocean's physical or chemical parameters (such as temperature, salinity, or currents) through automated instrument packages like the FerryBox system[13] or by deploying automated floats. But if the presence of research staff or students[14] is vital to taking such measurements, they are hosted on board. Even if they are not all recorded, voyages aboard such vessels are in any case much fewer than those of the 2,000 scientists who embark every year on ships belonging to the French Oceanographic Fleet (FOF)[15], which coordinates and makes available major research resources that far exceed those available for opportunity-driven campaigns.

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[10] *From the 1930s onwards, the development of polar tourism has given scientists the opportunity to join tourists on board to make observations and take samples.*

[11] *Several commercial airlines have long contributed to research, for example via the MOZAIC (Measurement of Ozone and Water Vapour on Airbus in-service Aircraft) programme and now IAGOS (In-service Aircraft for a Global Observing System), which builds on its legacy. The CNRS and the German interdisciplinary research institution Forschungszentrum Jülich (FZJ) have, for instance, signed a cooperation agreement with Hawaiian Airlines to carry out atmospheric measurements as part of IAGOS.*

[12] *Among many other examples, see the partnership signed on 28 October 2022 by the CMA-CGM Group and Ifremer to ramp up ocean science research.*

[13] *See https://www.flotteoceanographique.fr/en/Facilities/Tooling/Ship-Equipment/Measuring-instruments/Ferrybox; see too the FerryBox network working with the European Global Ocean Observing System, EuroGOOS, that uses ferries operating in the Mediterranean and North Seas as vessels of opportunity to acquire continuous ocean measurements: https://www.ferrybox.org/*

[14] *Here we could cite the Bougainville Mission, launched in September 2022 through a partnership between the French Navy, Sorbonne University and the CNRS, with the support of Naval Group, which will give ten Sorbonne University students the opportunity to spend 12 months on board French Navy ships to study the ocean microbiome as part of the international Plankton Planet programme. See https://www.naval-group.com/en/bougainville-mission-exploring-invisible-life-our-oceans.*

[15] *The French Oceanographic Fleet (FOF) is a very large research infrastructure now operated by Ifremer that, since 2018, has pooled resources previously managed by Ifremer, the CNRS, the French Polar Institute Paul-Émile Victor (IPEV) and the French Research Institute for Development (IRD). The FOF has four deep-sea vessels (Pourquoi Pas?, L'Atalante, Thalassa and Marion Dufresne), two overseas vessels (Antea and Alis), five coastal vessels (Europe, Côtes de la Manche, Téthys II, Thalia and Haliotis) and seven station vessels (Antédon II, Néréis II, Sépia II, Sagitta III, Neomysis, Planula IV and Albert Lucas). The fleet also includes a wide range of scientific equipment, such as the manned deep-sea submarine Nautile, ROVs and drones, as well as the onboard, stationary and mobile systems needed for oceanographic work. According to the FOF's ocean science working days (Rencontres de la FOF, 29 March-1 April 2021), 1,821 scientists were taken on board their vessels in 2019, in addition to 90 doctoral candidates and 336 students. For more details, see*

Taking advantage of logistical resources used for activities that are not designed to acquire scientific knowledge is nonetheless an opportunity for research, which generally has everything to gain from it. Even though these campaigns often take place without any clearly established institutional partnership, the public or private operator generally lends its assistance to the research staff free of charge or for a modest financial contribution intended, for example, to remunerate the time spent by the crew setting up or retrieving the scientific instruments. No feedback is sought on research findings, and there are no restrictions on their publication or use, which makes it all the more attractive for scientists.

On the face of it, the campaigns currently being offered by some tourism operators such as Compagnie du Ponant also appear to represent a similar research opportunity.

At the time of writing, this company is hosting four scientists on board *Le Commandant Charcot* for each cruise. They are selected by a scientific jury on the basis of their research projects through the Arctic Research Icebreaker Consortium, ARICE[16]. After some trial and error, the agreements governing these field campaigns are now clear, precise and in the best interests of research[17]. It appears that the costs of the scientists' transport and accommodation before joining the ship are covered by Compagnie du Ponant (through a lump sum of €2,000). They are then provided with accommodation, food and assistance on board by a coordinator who liaises between them and the crew. In addition to carrying out their research, they can exchange with other passengers and professional 'scientific mediators' (often naturalists), and give so-called 'scientific mediation and promotion' presentations, but they are neither required nor paid to do so. Finally, Compagnie du Ponant has no control over the research data collected, which remain the sole property of the scientific community. It simply asks that its support be mentioned in scientific publications, which is standard practice.

At first glance, these opportunity-driven campaigns at the poles also appear to be of particular value for polar research in particular[18]. While this field, which lies at the heart of the IPCC's expert reports, is an important part of climate science, access to the polar oceans is a financial, material and logistical challenge for research staff. The resources allocated to polar research, including oceanography, are notoriously inadequate[19], particularly in France, which has no polar research icebreakers but only

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https://www.flotteoceanographique.fr/en/Who-we-are/Organization-and-scope/Scientific-Council/French-Oceanographic-Fleet-long-range-planning.-2017-2030

[16] See https://arice-h2020.eu/closed-calls. As part of the European Union's Horizon 2020 research and innovation programme, ARICE aims to pool and optimise observation resources in the Arctic. Less familiar with the Southern Ocean and Antarctica, its scientific selection committee nevertheless evaluates requests to board Le Commandant Charcot for this destination.
For 2024, Compagnie du Ponant has announced that it will also be organising "a science-led cruise" with 22 scientists on board. See https://www.youtube.com/watch?v=hrJH3ubWBuY&t=1446s

[17] COMETS' assessment is based on its review of several agreements between Compagnie du Ponant and the CNRS, and between Ifremer and the CNRS.

[18] See the survey organised in March 2022 at the request of Compagnie du Ponant by J. Chappellaz, Research Director at the CNRS and Director of the French Polar Institute, IPEV, from 2018 to 2022; its purpose was to "better identify the expectations of the French scientific community working at the poles regarding the offer to host scientists free of charge on board the icebreaker". Most of the researchers who replied said they were interested (60 out of 85 respondents out of a total of 600 contacted). See J. Chappellaz, summary of replies to the national survey on science aboard the vessel Le Commandant Charcot, 4 May 2022.

[19] See France's Polar Strategy for 2030, presented on 5 April 2022 by the Ambassador for the Poles, which calls for a significant increase in resources for polar research; see also the recent Report on Polar Research presented by M. Bouloux, French National Assembly, Commission on finance, general economy and budgetary control, June 2023. See also the appeal by Bruno David, Jean Jouzel and Valérie Masson-Delmotte ahead of the international One Planet - Polar Summit in Paris (8-11 November 2023), recommending that France should once again become a great polar nation by investing more in research to improve our understanding of the climate (Le Monde, 10 October 2023).

vessels with reinforced hulls[20]. Scientists therefore have to work in partnership with foreign vessels[21], the particular difficulty arising is that the "ship time" granted to them is limited and/or costly.

Outside ice-covered areas, FOF vessels can only provide scientists with limited ship time. Because of limited funding compared with that of other countries, these vessels cannot operate all year round for research, as their business model includes being leased to private companies for part of the year[22].

This being so, the chance of using fishing, merchant or tourist vessels to obtain free or low-cost access[23] to unused or little-used maritime routes, particularly in ice-covered areas, appears to be very advantageous to scientists. With regard to opportunity-driven campaigns such as those offered by Compagnie du Ponant on *Le Commandant Charcot*, COMETS has heard the argument of pragmatism put forward by some of the players it has interviewed. "Even though the scientific instrumentation on this vessel is (for the moment) limited in scope, and the research *a priori* less valuable than that carried out on an oceanographic vessel[24], it would be absurd to deprive ourselves of any new scientific data able to be obtained at little cost through journeys that would be made in any case."

2. However, COMETS considers that opportunity-driven campaigns such as those on board *Le Commandant Charcot* are problematic for two reasons.

Firstly, polar tourism (or indeed tourism in other vulnerable areas such as lagoons, protected areas, the ocean depths, space, etc.) is an ethically questionable activity[25], even if the company carrying it out operates in a responsible manner[26]. Although legal, this form of tourism has a negative impact on an environment that deserves special protection. It is necessary to

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[20] *Marion Dufresne, L'Astrolabe and Pourquoi Pas?*

[21] *They are regularly hosted on the Amundsen (Canada), Palmer (United States), Aurora Australis (Australia), Polarstern (Germany), James Clark Ross and Sir David Attenborough (Great Britain).*

[22] *As a public body with industrial and commercial functions (EPIC), FOF operator Ifremer, for example, hires out its vessels for 40% of the time each year to private companies such as cable-layers needing to map the sea floor.*

[23] *Being hosted on a vessel of opportunity always has a cost, if only in terms of human resources.*

[24] *The interviews conducted by COMETS revealed: 1) a consensus on the quality of the research projects submitted by researchers embarking on Le Commandant Charcot, as scientists are now selected by ARICE (see note above); scientists taking part in cruises comply with the same conditions as those for FOF campaigns: data qualification, dissemination, and exploitation with the drafting of a campaign report for their employer; 2) however, assessments of the campaign varied widely; for some, the facilities offered were not suitable for a research project, but could be used to obtain useful data ("a laboratory with an opening to the sea means that weather buoys, temperature-salinity probes and other sampling instruments can be launched"; "As far as continuous measurements of temperature, salinity and water composition are concerned, Le Commandant Charcot is of scientific interest, especially as it retraces the same routes, so probes, beacons, etc. can be recovered the following year"). For other people interviewed, the facilities offered by Le Commandant Charcot were greatly limited compared with the infrastructures generally used to support polar research; moreover, ship time has to fit in with a schedule designed for tourists; research activities also have to fit in with the desiderata of the captain, who remains 'sole master on board' and responds first and foremost to the demands of tourism; although the same applies to a certain extent to FOF vessels (Pourquoi Pas?, L'Atalante, Marion Dufresne), their captains are more receptive to scientists' requests; 3) a probable ramp-up in the future of the equipment available to scientists on board Le Commandant Charcot.*

[25] *In addition to polar tourism, the focus here is on the development of tourism that is often presented as 'scientific' in so-called 'unique' locations, with the aim of "linking scientific research with the community of fellow citizens that WE are" (https://www.terra-scientifica.com/Terra-Scientifica-le-Salon-des-Voyages-qui-ont-du-Sens.html). See, for example, the many lagoon cruises and, on a smaller scale, "deep-sea tourism" (in submersibles) and "space tourism" (New Space being characterised by the proliferation of private players, some of whom offer space travel): (French version only) https://www.radiofrance.fr/franceculture/podcasts/le-journal-des-sciences/le-journal-des-sciences-du-mercredi-15-septembre-2021-3683589).*

[26] *In addition to the protocols that apply to tourism operators and tourists themselves in the Arctic (AECO) and Antarctic (IAATO) concerning the use and transport of heavy fuel oil, the prevention of illegal wildlife trade, the use of drones for recreational purposes, etc., Compagnie du Ponant—sailing under the French flag—is subject to strict rules on waste treatment, CO_2 emissions, the use of single-use plastic, and so on.*

take into account its inevitable pollution and disruptive effects[27] on ecosystems that are not very resilient because they have not been exposed to any or much human activity, some of them being particularly fragile[28]. We should also mention its acculturative impact on northern indigenous populations, who are rarely consulted and whose lifestyles it is tending to disrupt[29].

Despite national and international warnings[30], however, polar tourism is expanding on an unprecedented scale and putting the poles under increasing pressure[31]. Looking at the Arctic Ocean in 2019-2020, there were 85,000 tourists in Greenland, 120,000 in Svalbard (Norwegian archipelago) and 10,000 in the Canadian Arctic. As for the Southern Ocean, around Antarctica, there were some 3,000 tourists in 1990, compared with 56,000 during the 2018-2019 season, almost 75,000 in 2021-2022 and 105,000 during the 2022-23 season[32], not forgetting to add at least 30% more for the crews (sailors, pilots, officers). Furthermore, the number of polar tour operators is steadily increasing[33], and dozens of new vessels designed to operate in the polar regions are under construction and will be launched in the coming years. The situation is even more critical in the ice-free regions of the Arctic Ocean, where the maritime transport of goods is much more developed than polar tourism, and where there is no equivalent to the Antarctic Treaty, only various sector-specific treaties. This is a troubling development.

Secondly, opportunity-driven campaigns that specifically use the presence of scientists on board as an integral tourist attraction pose an additional ethical challenge. This is the case for the field campaigns offered by Compagnie du Ponant. Far from being incidental to its operations, hosting scientists on board *Le Commandant Charcot* lies at the very heart of the company's business strategy, as its communication indicates.

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[27] Even though Le Commandant Charcot has a hybrid electric engine powered by liquefied natural gas (LNG), it emits 250 tonnes of CO_2 equivalent per day at sea, in particular to break ice, not to mention the carbon impact of the flights taken by customers to reach the departure point and then return home at the end of the cruises. Moreover, like many other operators, Compagnie du Ponant offers activities (observing wildlife, visiting nature reserves, excursions in snowshoes, with sled dogs or zodiacs, ice fishing, etc.) which run the risk of introducing invasive species and causing disturbances, in particular to the albedo effect, i.e. the reflective power of the areas concerned.

[28] This is particularly true in the Arctic and especially in Greenland, which is both environmentally (tundra) and socially vulnerable, heavily impacted by global warming and now by tourism (85,000 visitors in 2019 for 56,000 inhabitants).

[29] The threats posed by tourism, fishing and mining companies in the polar regions are regularly denounced by researchers. See, for example (in French), C. Loïzzo and C. Tiano, "L'Arctique à l'épreuve de la mondialisation et du réchauffement climatique" [The Arctic in the face of globalisation and global warming] Perspectives géopolitiques, Armand Colin, 2019; A.H. McCarthy et al., "Ship traffic connects Antarctica's fragile coasts to worldwide ecosystems", Department of Environmental Science and Policy, University of California, 10 January 2022.

[30] See the French polar strategy, which stresses the vulnerability of the polar regions and the need to set up marine protected areas (https://www.vie-publique.fr/en-bref/284776-arctique-et-antarctique-quelle-strategie-polaire-pour-la-france); see too the Joint Communication on a stronger EU engagement for a peaceful, sustainable and prosperous Arctic by the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 13 October 2021, and the work of participants in the Antarctic Treaty Consultative Meeting, which is held every year to strengthen the regulatory framework for human activities by consensus. These studies all highlight the role of the poles in the global climate system, which continues to deteriorate.

[31] Denis Jallat, "Le tourisme polaire et sa construction dans l'histoire" [The historical development of polar tourism], see "Tourisme polaire", 2009, pp. 21-28; F. Lasserre, A. Choquet, C. Escudé-Joffres, "Le tourisme polaire, Vers une appropriation des espaces polaires" [Polar tourism, a step towards appropriating polar regions] Géopolitique des pôles, Le Cavalier Bleu, 2021, pp. 129-136.

[32] Tourism figures for the Arctic Ocean are estimates; according to Anne Choquet, different countries count their tourists in different ways, which makes it difficult to obtain precise statistics. For Antarctica, see Report 2022-23 of the International Association of Antarctic Tour Operators (IAATO), IP 55 report presented at the 45th Antarctic Treaty Consultative Meeting (Helsinki, 2023).

[33] In 2023, for the Arctic, AECO has 28 members and 13 provisional members; for the Antarctic, IAATO has 109 members, including 57 operators and provisional operators as well as 52 associates (data taken from IAATO reports submitted to Antarctic Treaty Consultative Meetings).

Traditionally, even private operators do not publicise their role in hosting opportunity-driven campaigns. The airline Air France, for example, simply states that it "supported" this or that operation. As for the CMA-CGM Group, the Ifremer research projects it supports are only mentioned in internal communications. Installing sensors or probes on an airliner or merchant ship is hardly in itself a sales argument to attract customers.

For Compagnie du Ponant, on the other hand, references to science are almost omnipresent, and the presence of scientists on board is closely associated with the cruises offered. The company, which offers "unique voyages" and now "meaningful scientific voyages", is emphasising what it describes as a "winning combo of tourism and [polar] research", and the unrivalled "customer experience" provided by the presence of scientists on board. By choosing to travel aboard *Le Commandant Charcot*, customers are embarking on a "citizen science expedition". Not only do they see research being carried out, but they can also contribute to it (by taking phytoplankton samples, observing clouds for NASA, or providing information for the Happywhale platform, a participatory research tool dedicated to studying whales, for example). In this way, they can become "players in the protection of polar environments" as part of a cruise that will help "increase scientific knowledge of these environments" and work "to protect the planet"[34].

COMETS notes that a similar approach has been employed by other cruise operators who use research staff as nature or cultural guides, or 'scientific mediators' for tourists[35]. Even if these are not field campaigns designed to collect scientific data, this 'model' can also be questioned.

Given that the presence of scientists on board inevitably influences customers' decisions to take part in a cruise, whether for intellectual reasons or to ease their conscience, it is likely to boost the **problematic ramping up of polar tourism**.

This is exactly why the opportunity-driven campaigns on board *Le Commandant Charcot* raise a particular ethical issue for COMETS. This issue is not linked to Compagnie Ponant's status as a private company, nor to the fact that this luxury tourism operator targets 'privileged cruise passengers', nor even to the fact that the independence of research might be undermined or that research staff might be exploited by being encouraged to act as scientific tourism facilitators[36]. It stems from a concern that the **presence of scientists on board reinforces the trend towards mass tourism at the poles, an activity that COMETS considers ethically problematic**.

COMETS is well aware of the objections that may be made in this respect. Firstly, its point of view will not prevent scientists from boarding vessels of opportunity, nor polar tourism from thriving. It could also be argued that other economic sectors that support research (such as air and maritime transport)

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[34] See https://escales.ponant.com/en/challenge-polar-sciences/; https://escales.ponant.com/en/citizen-science-whales-exploration/ These quotes are based on a website consultation of 02/02/2023.

[35] These guides, recruited by most polar tourism operators and used, for example, by Grand Nord Grand Large, supervise customer excursions and observations. Ten per cent of them are researchers by profession, working in a personal capacity in parallel with their usual activity.

[36] Although it appears that in the early days, some of the researchers on board were asked to wear Compagnie du Ponant jackets, and others have said they would feel uneasy about conducting their research in such a setting, communication activities have apparently always been optional, outside working hours and unpaid. In any case, as long as the rules on working time and the holding of multiple positions are observed, giving such talks is not incompatible with the duty of researchers to inform the public and popularise science.

also have an impact on ecosystems. But in these cases, the contrast is not so 'stark'[37] between the purpose of the business activity, its effects and the type of environment under threat.

Lastly, COMETS is aware that, by virtue of a number of partnerships with private operators, CNRS research staff already travel to the poles, sometimes under the media's spotlight. We are thinking here of the agreement between several research institutes and the Tara Ocean Foundation, set up by the Agnès B and Christian Bourgois groups, which enables the schooner *Tara*, and soon the drifting *Tara Polar Station*, to carry out scientific missions at the poles[38]. However, these partnerships are not about tourism; they are about joint research with public bodies such as the CNRS, the scientists being in control of what they do on board and where they go. In the case of the schooner, this agreement is also accompanied by a large-scale educational effort on the part of all those involved, aimed at the general public and schoolchildren. These factors clearly distinguish such partnerships from campaigns on polar tourism vessels.

From this perspective, it is clear that detailed consideration of the ethics behind research partnerships of any kind requires them to be examined on a case-by-case basis, taking into account many different factors, criteria and values. Considerations need to cover not only the symmetry, balance and fairness of the partnership, but also the type of activities undertaken by the partner, their impact—whether immediate or long-term, potential or proven—their contribution in terms of knowledge, values to be protected, degree of publicity, how they affect the image of the CNRS and the credibility of scientific research, and so on.

Ultimately, COMETS is sympathetic to some of the arguments put forward, in particular the critical nature of polar research and the opportunity offered by tourist vessels to help carry it out at low cost in places that are difficult for scientists to reach. It believes, however—particularly in view of the limited scientific research that can currently be carried out during opportunity-driven campaigns on polar tourism vessels—that participation is inconsistent with the need hammered home by numerous scientific messages to protect vulnerable regions, especially the poles, and with COMETS' recommendations[39].

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[37] *The phrase is borrowed from French MP Jacques Maire, author of a report on a mission aboard Le Commandant Charcot entitled "Une première française: le Commandant Charcot au Pôle nord - Une présence durable?" [A French first: Le Commandant Charcot at the North Pole - A sustainable presence?] (1-15 May 2021). The report also recommends that the ship's role be 'mixed', i.e. be used for "temporary scientific charters for French oceanographic research".*

[38] *See https://fondationtaraocean.org/en/home/ and, in French, https://www.observatoire-pelagis.cnrs.fr/wp-content/uploads/2022/09/Rapport-Campagne-Greenpeace-Megafaune-Guyane-2019.pdf. This kind of agreement also applies outside polar regions: see, for example, that between the CNRS and Greenpeace France in 2019 to study marine megafauna off the coast of French Guiana.*

[39] *See in particular COMETS Opinion no. 2022-43 "Integrating environmental issues into research practices – An ethical responsibility".*

C. RECOMMENDATIONS

Following its analysis, COMETS recommends:

1. Taking a clear public stance as an institution

COMETS recommends that the CNRS take a clear public stance on opportunity-driven campaigns and the conditions governing their acceptability in order to avoid leaving research staff to address these issues on their own. In addition to the traditional criteria that guide research partnerships (scientific added value, extent and type of contributions in terms of financial support or skills, etc.), it recommends that **the CNRS clarify the environmental, social and cultural values it upholds in relation to its mission, as well as those with which it feels it must not be associated to avoid tarnishing the institution's image**. **'Red lines' should be clearly identified and kept up to date in response to a constantly evolving range of campaigns on offer.**

With regard to opportunity-driven campaigns that would result in the CNRS being associated with, and thus endorsing, tourist activities in vulnerable areas (polar regions, lagoons, protected areas, the ocean depths, space, etc.), COMETS recommends that the CNRS pay particular attention to the balance between the scientific value and appropriateness of the resources offered by the vessel of opportunity on the one hand, and the potentially negative impact of this campaign on the environment, local populations and the image of research in general and the CNRS in particular[40], on the other. In this respect, COMETS has serious reservations about opportunity-driven campaigns like those currently offered by Compagnie du Ponant aboard *Le Commandant Charcot*.

It also invites the CNRS to consider the cases in which research staff—albeit on an individual basis and in compliance with the rules governing the holding of multiple positions—work as nature or cultural guides for tourism in fragile environments. While it is aware of the legitimate educational motivations of these 'scientific mediators', COMETS nonetheless recommends that these staff and the CNRS conscientiously examine whether their participation is justified[41].

2. Providing a general framework to replace *ad hoc* negotiations

COMETS also recommends that the CNRS establish a general framework applicable to those opportunity-driven campaigns that are ultimately considered acceptable. This **would have the advantage of providing guidance for research staff and regional delegations**[42]. Besides recalling

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[40] As well as looking at each campaign individually, the CNRS would benefit from having an overview of the total number of campaigns organised in a given area and ensuring that they are coordinated on a national level.

[41] Some are already voicing their reservations; see M. Correia, "En Antarctique, des croisières 'luxe, calme et écocide'" (see https://www.mediapart.fr/en/journal/france/190623/breaking-ice-champagne-ecocidal-luxury-cruises-antarctica), Mediapart, 18 June 2023.

[42] The internal request suggests that such a framework already exists and that the more general rules governing opportunity-driven campaigns are therefore "known and clearly stated". However, a partnership contract drawn up by a delegation for one of its staff cannot constitute a "known and clearly stated" rule.

the criteria and values mentioned above and any legal rules that may apply[43], this framework would guarantee that each opportunity-driven campaign is conducted in accordance with the following rules and thus complies with the interests of science, the duties of the scientific community towards society, and the responsibilities of researchers[44]:

- A clear scientific project and a demonstration that the opportunity-driven campaign will provide data of use to the proposed project;
- A detailed campaign report and ex-post evaluation of the research project;
- Compliance with both criteria ensuring the independence and impartiality of research, and with rules governing the holding of multiple positions;
- All results and data collected are owned by the CNRS (the private operator has no rights to the results or data obtained);
- Publication and access to results without the private operator being able to hinder either, for instance by requiring prior right of review; particular attention must be paid to the reusability of the datasets collected for other research, as the principles of open science encourage research data to be 'reusable', which is particularly desirable when they have been obtained in fragile environments, in order to avoid duplicating research campaigns. The regional delegations that sign partnership agreements should inform the CNRS and heads of the joint research units involved of compliance with the framework.

COMETS furthermore recommends that the CNRS:

- **Engage in dialogue with other research institutions** to ensure that this framework is established in a concerted manner and is applied to all joint research unit staff, regardless of their laboratory's supervisory authority;
- Concerning oceanographic cruises:
    - **be a strong stakeholder in bodies responsible for coordinating or pooling research resources at sea**, whether national (FOF), European (European Polar Board for both polar regions) or international, so that a shared policy governing access to these research resources can be discussed (optimum use, fewer points of contact, etc.);
    - draw the attention of the European Commission to the advisability (or not) of ARICE offering a showcase for opportunity-driven campaigns combined with tourism in the polar regions.

[43] *For example, special regulations apply to research in the French Southern and Antarctic Lands (TAAF); see, in French, https://taaf.fr/missions-et-activites/soutien-a-la-recherche/La-recherche-dans-les-terres-australes-francaises*
[44] *See COMETS Opinion no. 1996-03 on scientific research and private fund-raising.*

IV. QUALIFIED PERSONS CONSULTED

- Marianne Alunno-Bruscia, Delegate for ethics and scientific integrity, Ifremer
- Mathieu Ardyna, CNRS researcher, Takuvik International Research Laboratory, University of Laval/CNRS
- Nicolas Arnaud, CNRS Research Director, Director of the National Institute for Earth Sciences and Astronomy (INSU)
- Jacques Arnould, Ethics expert, CNES
- Jérôme Chappellaz, CNRS Research Director, Professor at the Ecole Polytechnique Fédérale de Lausanne (EPFL), former Director of the French Polar Institute, IPEV
- Anne Choquet, Law Faculty member at the University of West Brittany, Chair of the French National Committee for Arctic and Antarctic Research (CNFRAA)
- Carole Chrétien, Director of Business Relations, CNRS
- Wolfgang Cramer, CNRS Research Director, IPCC member, member of the French branch of Scientist Rebellion
- Wassim Daoud, Director of CSR and sustainable development at Compagnie du Ponant
- Jean-François Doussin, Deputy Scientific Director of the Oceanic and Atmospheric Division, INSU
- Agathe Euzen, Deputy Scientific Director of INEE, the Ecology and Environment Institute of the CNRS
- Charles Gravatte, Secretary General of Compagnie du Ponant
- Françoise Gaill, emeritus Research Director at the CNRS, former Director of INEE and vice-chair of the Ocean-Climate platform
- François Houllier, CEO of Ifremer
- Marie-Noëlle Houssais, CNRS Research Director, Science Delegate for Polar Affairs, INSU
- Catherine Jeandel, CNRS Research Director at the LEGOS Laboratory for Space Geophysics and Oceanography, Director of the Midi-Pyrenees Observatory (OMP), member of FOF's Scientific Council, and FOF Coordinator for long-term planning
- Bruno Joubert, Adviser for institutional relations, Compagnie du Ponant
- Camille Lique, Ifremer researcher
- Marie Manceau, CNRS Research Director
- Stéphanie Mariette, INRAE researcher, member of the French branch of Scientist Rebellion
- Michel Mortier, Director General of the CNRS Foundation
- Yan Ropert-Coudert, CNRS Research Director, Director of IPEV
- Jérôme Santolini, CEA Research Director, member of the French branch of Scientist Rebellion
- Vladislav Sidorenkov-Duprez, Science manager, Compagnie du Ponant
- Valérie Thouret, CNRS Research Director, OMP Aerology Laboratory
- Sébastien Triqueneaux, CNRS Research Engineer, Institut Néel, member of the French branch of Scientist Rebellion

V. LIST OF ACRONYMS

ANR : Agence Nationale de la Recherche
APC : Article Processing Charges
CC : Creative Commons
CC-BY : Creative Commons attribution
CIRAD : Centre de coopération Internationale en Recherche Agronomique pour le Développement
cOAlition S : initiative des organismes de recherche ayant proposé le Plan S
DIST : Direction de l'Information Scientifique et Technique du CNRS
DADVSI (loi): Droit d'auteur et droits voisins dans la société de l'information
DEAL : DEutsch Alliance Lizenzen
DOAB : Directory of Open Access Books
DOAJ : Directory of Open Access Journals
DOI : Digital Object Identifier
DORA : Declaration on Research Assessment
EPRIST : Association des responsables IST des organismes de recherche
ESR : Enseignement Supérieur et Recherche
IFRS : International Financial Reporting Standard
IST : Information scientifique et technique
ESAC : Efficiency and standards for articles charges
HAL : Hyper Articles en Ligne
INRA : Institut national de la Recherche Agronomique
LERU : League of European Research Universities
MAA : Manuscrit Auteur Accepté
MESRI : Ministère de l'Enseignement Supérieur de la Recherche et de l'Innovation
OFIS : Office Français pour l'Intégrité en Science
OMPI : Organisation Mondiale de la Propriété Intellectuelle
PCI : Peer Community in
SCOAP3 : Sponsoring Consortium for Open Access Publications in Particle Physics.
SHS : Sciences Humaines et Sociales
WCRI : World Conference on Research Integrity