

**Announcement of Opportunity
for Medical, Physiological and
Psychological Research Using
Concordia Antarctic Station as Human
Exploration Analogue
*AO-10-Concordia***



© Y. Frenot, IPEV

Letter of Intent due:

February 22nd, 2010

* * * * *

Proposal due:

April 12th, 2010

Summary for the Concordia Research Opportunity

- The Human Spaceflight Directorate of the European Space Agency, in cooperation with the Concordia Steering Committee, is announcing an opportunity to propose investigations in medicine, physiology and psychology, using the unique environment of Concordia station as a Human Exploration analogue.
- Eligibility: The scientific institution for which the coordinator of a proposal is working must be located in one of the ESA member or associated member states that contribute to the ELIPS programme: **Austria, Belgium, Canada, Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland**. Scientists from ESA Member States that do not contribute to the ELIPS Programme (presently Finland, Portugal, Luxemburg and the United Kingdom), and scientists from other European countries having a cooperation agreement with ESA, are encouraged to enquire with their national space organisation about the conditions for their participation in proposals to ESA. While it is not a formal requirement, it is, due to the organisation of Concordia operations, highly recommended that the research teams include French and/or Italian scientists.
- Submission of Letter of Intent and proposals will be done electronically. The proposal must use the template from the AO website. Submission of Lol and proposal will be via the web
 - o For Lol: <http://www.esf.org/loi/concordia>
 - o For proposals: <http://www.esf.org/concordia>
- For questions related to this announcement of opportunity please contact:

ESA/ESTEC/HSF-USL
Oliver Angerer
Tel. +31 71 565 3728
Announcement-specific email: Concordia@esa.int
- For technical questions related to the submission website please contact EsaPeerReview@esf.org
- Important dates:
 - o Letter of Intent due: 22nd February 2010
 - o Proposal workshop (at ESA/ESTEC, NL): 2nd March 2010
 - o Proposals due: 12th April 2010
- Implementation schedule: Depending on their complexity, some selected proposals may already be implemented for the winter-over season 2011, implying shipping of equipment, crew training etc in autumn 2010. The other selected ones will be implemented in the following seasons.

Table of Contents:

1	Description of the Opportunity.....	4
1.1	Introduction.....	4
1.2	Announcement Objectives	4
1.3	Concordia Station Overview.....	4
1.4	Long Term Medical Survey (LTMS)	7
2	Types of Proposals	7
3	Proposal Evaluation and Selection Procedures	8
3.1	Scientific Merit Review	8
3.2	Evaluation of Feasibility and Selection Recommendation.....	9
3.3	Data Rights.....	9
3.3.1	General.....	9
3.3.2	Practical implementation of data policies	9
3.3.3	Data Access:	10
3.3.4	The Erasmus Experiment Archive (EEA)	10
3.3.5	Acknowledgement	11
3.3.6	Support of Education and Outreach	11
4	Proposal Preparation Guide.....	12
4.1	Contact	12
4.2	Time Schedule	12
4.3	Letters of Intent	12
4.4	Proposals and Funding	12
4.5	Proposal Submission.....	13
4.5.1	Project Description	13
4.5.2	Management Approach	14
4.5.3	Biographical Sketches	14
4.5.4	Supporting Budgetary Information.....	14
4.5.5	Ethics & Safety	15
4.5.6	Experiment Data Sheet	15
	ANNEX A: Long Term Medical Survey (LTMS)	16
	ANNEX B: Available LTMS Data	17
	Concordia 1.....	17
	Concordia 2.....	17
	Concordia 3:.....	17

1 Description of the Opportunity

1.1 Introduction

The French Polar Institute (Institut Paul Emile Victor, IPEV) and the Italian Antarctic Programme (Consortio per l'Attuazione del Programma Nazionale di Ricerche in Antartide, PNRA S.C.r.l.) have built and are operating a scientific base, called Concordia station, on the Antarctic mainland; they have also created a Steering Committee to oversee the Concordia activities..

The European Space Agency (ESA) has entered into a cooperation with IPEV and PNRA S.C.r.l.. While the Antarctic research organisations are interested in europeanising the utilisation of the station, ESA's Directorate of Human Spaceflight recognizes the interest of the special environment of Concordia for example for preparatory activities related to future human exploration missions to Moon or Mars. As such, the Concordia related activities are part of a larger effort that also includes e.g. activities like the Mars500 programme, bed rest studies, etc.

As one of the cooperative activities it has been agreed that ESA would coordinate regular Europe-wide announcements of opportunity for all research in medicine, physiology and psychology in Concordia station. This is the third such announcement; previous ones were published in 2003 and 2007. Other activities in which ESA is involved at Concordia station together with IPEV and PNRA S.C.r.l. include e.g. medical monitoring, operational validation of life support technologies, psychological training of crews (by trainers from the European Astronaut Center) etc.

1.2 Announcement Objectives

The Steering Committee of Concordia and ESA announce an opportunity to propose investigations in medicine, physiology and psychology, using the unique environment of Concordia station. This is aimed at increasing the knowledge of human adaptability to extreme environments (isolation, confinement, climate, altitude) and improving medical care in isolated locations. Depending on their complexity, some selected proposals may already be implemented for the winter-over season 2011, implying shipping of equipment, crew training etc in autumn 2010. The other selected ones will be implemented in the following seasons.

1.3 Concordia Station Overview

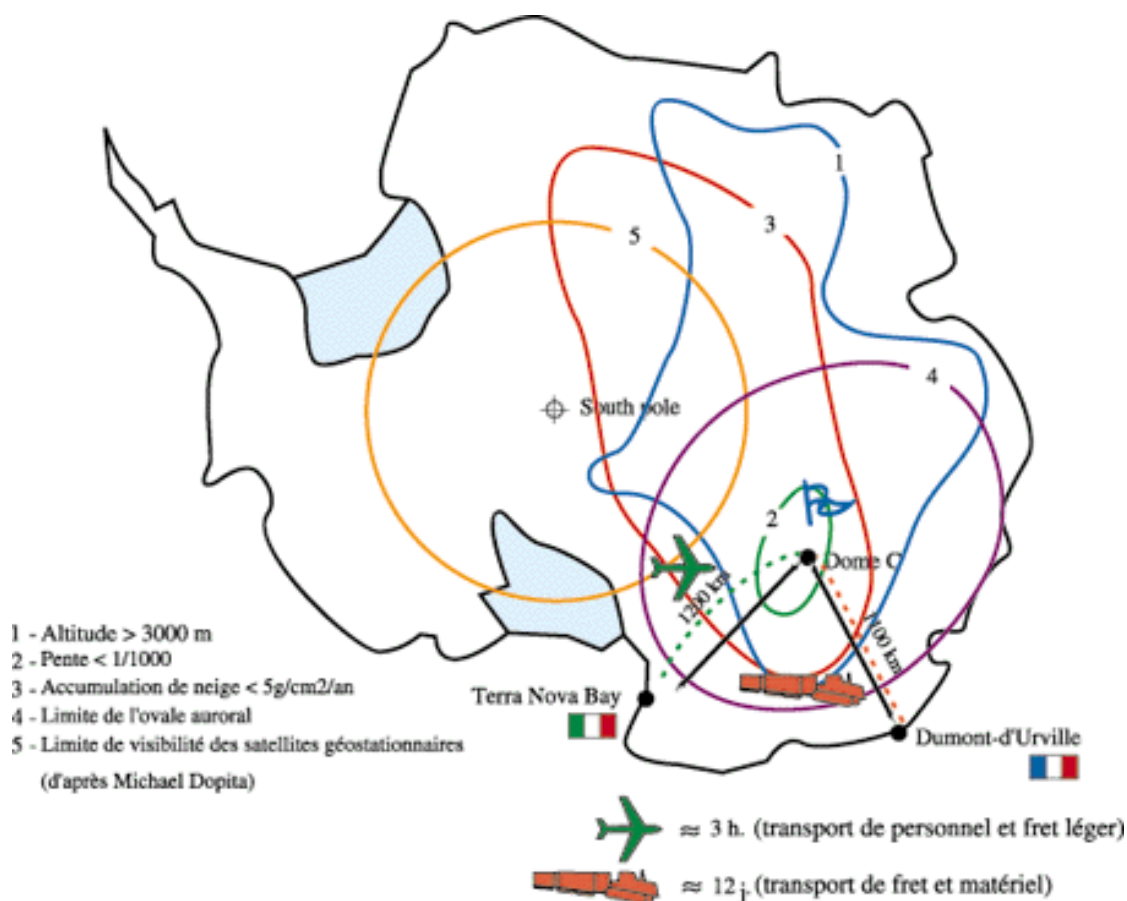
Concordia station is a permanent international research facility high on the Antarctic ice cap. The station was built by the French Polar Institute, IPEV, and the Italian Antarctic Programme, PNRA S.C.r.l.. The station has been permanently manned since November 2004.

The objective of Concordia station is to operate as an international research facility to conduct scientific programmes. Main fields of interest are glaciology, atmospheric sciences, astronomy and astrophysics, Earth sciences, technology and human biology and medicine.

Concordia station is located on a high plateau on the Antarctic mainland at 75° 06' S, 123° 23' E. This location is 1100 km inland from Dumont d'Urville (French coastal station) and 1200 km inland from Mario Zucchelli Station at Terra Nova Bay (Italian coastal station). The location can be seen on Figure 1.

This area is considered to be one of the most hostile places on Earth. The extreme environment has the following characteristics:

Figure 1: Antarctica and the Location of Concordia Station © IPEV



- An altitude of 3200m, equal to an equivalent altitude of almost 4000m on the equator, air pressure is 645 hPa (→ chronic hypobaric hypoxia).
- The time from mid-November to mid-February is considered the summer period, the winter-period correspondingly from mid-February to mid-November.
- Overall mean temperature is -51°C, with a mean value of -30 °C during summer and -60 °C in winter (lowest record in 2002 -85 °C).
- The wind speeds are minimal with an average of 2.8m/s (5.4 knots).
- Precipitation range at Dome C is low, 2-10 cm snow per year.
- The landscape is “completely” flat.

Access to Concordia station is limited to the austral summer (November to February) due to the extreme weather conditions. There are two different ways to access the station. Coming from Hobart, Australia, by ship to Dumont d'Urville, heavy equipment is brought to Concordia using ground traverses, which take approximately 12 days and deliver almost 500 tons of payload. Main personnel and selected light cargo is transported by plane from Christchurch, New Zealand, to Mario Zucchelli Station and then further to Concordia. This last leg takes approximately 3-5 hours.

For the realisation of scientific programmes, the winter-over teams are generally available. Equipment for medical/physiological/psychological research on site is

limited, special required equipment might have to be provided by the researcher. The station can host up to 16 crewmembers for a winter-over (though so far it has usually been between 12-14 crewmembers. The winter-over teams are selected through medical/psychological screening. The team consists of technicians (for station infrastructure), scientists (to support scientific programmes), a cook and at least one medical doctor (MD). The personnel is in charge of the realisation of scientific programmes and the maintenance and operation of the station during the winter period. The overwintering crewmembers stay around 10-14 months in the station. During the Antarctic summer around 50 persons visit the station. The duration of the stays for the summer visiting personnel is from a few days up to 3 months.

The challenges for overwintering crews are manifold:

- Prolonged isolation and confinement.
- Hostile natural environment (extreme low outside- temperatures, chronic hypobaric hypoxia).
- Autonomy: the crew needs to be totally self-dependent especially from February to November where no access to and from the station is possible.
- Life in a small multicultural setting (different languages & behavioural customs).
- Limited mobility outside of the station buildings, especially during winter
- Understimulation, boredom.
- Night/Daylight variations.
- Change in atmospheric pressure at the beginning of the stay.

The described circumstances lead to a number of important restrictions for proposed projects:

- As the station is an operational setting, the main task of crewmembers is not to serve as medical/physiological/psychological test subjects. Participation in medical/physiological/psychological research is completely on a voluntary basis. Therefore experiments must be very low invasive (e.g. no rectal temperature probes, as little and as few blood samples as possible etc.) and little time consuming.
- A maximum of two hours per week and per subject might be available for research in human biology and medicine (all projects taken together).
- Only overwintering crews should be targeted.
- Exact composition of the winter-over crew, and exact times of their travel to or from Concordia are often known only relatively close to the actual dates, therefore flexibility in the implementation and good preparation of the experiments is of paramount importance.
- Knowledge of the English language varies among the crewmembers. Therefore, it is recommended that e.g. questionnaires are available also in French and Italian.
- Transportation of necessary equipment has to be organised well in advance. Weight and size of equipment (incl. consumables) should be minimized.
- Direct support is only possible during summer, in winter the crew is completely isolated.
- Typically the medical/physiological/psychological experiments would be performed by an ESA sponsored research medical doctor included in the crew specifically for conducting this type of experiments. Before the stay in Antarctica some training of protocols or e.g. specific laboratory techniques is possible.
- As the station is located outside of the footprint of most telecommunication satellites, real-time data transfer capabilities are limited.

- As in any human research effort, crewmembers have the right not to continue to serve as test subjects if they so wish.

General information about Concordia station can also be found at
<http://www.concordiabase.eu/>

1.4 Long Term Medical Survey (LTMS)

The cooperating agencies have established with the help of external advisers a baseline of biomedical and psychological parameters, which shall be measured in a standardised way during the Antarctic mission. The term “Long Term Medical Survey” (LTMS) is used for these selected biomedical parameters.

A more detailed description of the LTMS parameters that are currently being collected can be found in ANNEX A.

The data collected through the LTMS can be made available for analysis in the frame of selected research protocols if they are asked for in the original proposal.

Additionally LTMS data collected in previous missions can be requested by research proposals for retrospective analysis. Information on which data is available can be found in ANNEX B.

2 Types of Proposals

This Announcement of Opportunity (AO) invites proposals related to medical, physiological and psychological research making use of the specific environment of Concordia station. Duration of the experiments should be up to two years. Projects aiming at a longer duration must be resubmitted after this period. All proposals submitted in response to this AO are to be prepared and submitted according to chapter 4: Proposal Preparation Guide.

The following types of investigations are suggested to be of high relevance to be addressed by the respective proposals. However, this list is not exhaustive:

Medicine:

- Physiological adaptation in isolated and confined environments (ICE)
- Acute and chronic stress effects on health and well-being
- Chronic and acute high altitude physiology
- Physiological countermeasures
- Sleep & circadian rhythms

Psychology:

- LTMS data analysis
- Group dynamics and leadership in ICE
- Cultural & gender issues
- Habitability and psychological countermeasures
- Cognitive performance (complex operational tasks)
- Autonomous management of high risk/ stressful situations
- Sensory under-stimulation
- Psychophysiology

Multidisciplinary research approaches are specifically welcome.

3 Proposal Evaluation and Selection Procedures

An independent scientific merit (peer) review will perform the scientific evaluation, before IPEV and PNRA undertake a technical and implementation feasibility evaluation.

3.1 Scientific Merit Review

Programme-compliant proposals submitted in response to this AO will undergo a scientific merit (peer) review. Only those proposals most highly rated in the merit review process will undergo the additional review for feasibility.

This time, the scientific merit review will be outsourced to the European Science Foundation (ESF) under ESA contract. However, the principles outlined below will still strictly apply and the peer review process will be closely monitored by ESA

All of the following criteria will be used in determining the merit score:

Significance: Does this study address an important problem? If the aims of the application are achieved, how will scientific knowledge or technology be advanced? What will be the effect of these studies on the concepts, methods, or products that drive this field?

Approach: Are the theoretical framework, experimental design, data analysis and interpretation methods adequately developed, well integrated, and appropriate to the aims of the project? Is the proposal hypothesis-driven? Is the proposed approach likely to yield the desired results? Does the applicant acknowledge potential problem areas?

Innovation: Does the project employ novel concepts, approaches, or methods? Are the aims original and innovative? Does the project challenge existing paradigms or develop new methodologies or technologies?

Personnel: Are the scientific personnel appropriately trained and well suited to carry out this work? Is the evidence of the personnel's productivity satisfactory? Are the functions and responsibilities of the team members adequately described and appropriate? Does the project employ useful collaborative arrangements?

Environment: Does the institutional environment, in which the work will be performed, contribute to the probability of success?

In the review, each proposal will receive a scientific merit score between 0 and 100 points. As a result of the scoring the proposals will receive one of the following marks:

- Outstanding 100 - 91 points
- Excellent 90 - 81 points
- Very Good 80 - 71 points
- Good to Fair 70 - 46 points
- Unacceptable 45 - 0 points

The scoring will be weighted according to the 5 sub-criteria:

- Significance 30%
- Approach 25%
- Innovation 20%
- Personnel 15%
- Environment 10%

The peer board will also evaluate the proposal's relevance to the Concordia environment. Again, scores between 0 – 100 will be given, resulting in a second mark.

3.2 Evaluation of Feasibility and Selection Recommendation

The most highly rated proposals following the peer review will be passed on to experts from IPEV and PNRA S.C.r.l. who will perform a feasibility evaluation.

The results from the scientific merit evaluation, the Concordia environment relevance and the conclusions on the feasibility of the proposals will be reported to the Concordia Steering Committee, which, based on these inputs, will decide, which proposals can be considered for implementation at the Concordia station. This outcome, with support by ESA's advisory bodies, will be used in the development of ESA's selection recommendation to its relevant Programme Board (PB-HME).

The parties involved reserve the right to select only a part of a Science Team Coordinator's (STC) project if this portion is still of high scientific merit. The applicant will be given the choice to accept or decline such a partial opportunity. If two or more proposals address similar problems and/or adopt similar approaches, it may be requested that the STCs consolidate specific parts of their projects into a single project and work as one team.

The selected experiments will enter a pool of experiments and will be accommodated as soon as possible in the following seasons.

3.3 Data Rights

3.3.1 General

The general data policies of ESA's Directorate for Human Spaceflight, IPEV and PNRA S.C.r.l. will apply to all data resulting from the experiments in the context of this AO. The main relevant aspects, in their specific implementation for Concordia related activities, are described in this and the following paragraphs.

Final results of the studies shall be made available by the scientific teams to the scientific community through publication in appropriate journals or other established channels as soon as practicable and consistent with good scientific practice. In the event such reports or publications are copyrighted, ESA, IPEV and PNRA S.C.r.l. shall have a royalty-free right under the copyright to reproduce, distribute, and use such copyrighted work for their purposes.

3.3.2 Practical implementation of data policies

Two types of experiment data are identified:

Category 1 data will be obtained and processed under the responsibility of a Science Team Coordinator (STC) for the experiment protocol. Data not requested by any other STC may be used exclusively by the STC for scientific purposes. For data requested by more than one STC, each STC must agree before the study starts as to the conditions for the data usage for scientific purposes. This category of data shall

be referred to as “STC proprietary data.” The STC proprietary data may be used by the sponsoring agencies for internal purposes. The sponsoring agencies agree that this data will not be made public for 1 year after the completion of the study (last point of data collection before return from Antarctica).

Category 2 data comprise standardized LTMS parameters, as defined and owned by ESA, IPEV and PNRA S.C.r.l.. STCs can apply, and are even encouraged to use the standardized parameters. ESA, IPEV and PNRA S.C.r.l., in consultation with experts, will decide on the first publication rights for the standardized parameters. Scientific merit of the respective proposal and thematic relevance will be the key factors influencing the ranking.

Category 2 data will be stored in the future European Microgravity Database for Clinical Research (EMD-CR). It is compulsory that the respective STC will make Category 1 data available to ESA, IPEV and PNRA S.C.r.l. for any use 12 months after completion of the study.

3.3.3 Data Access:

A STC can access proprietary data from other STCs participating in the study through a written data sharing agreement (signed by involved STCs). In that case, ESA will ensure that a data-sharing plan among the participating STCs is established prior to the beginning of the respective studies.

All STC proprietary data and LTMS will be treated as medical confidential information by the participants and ESA, IPEV and PNRA S.C.r.l..

3.3.4 The Erasmus Experiment Archive (EEA)

The EEA is an ESA service within the Human Spaceflight Directorate to the international scientific community. Abstracts, from all European microgravity experiments performed to date are collected in this database. Experimenters sponsored by ESA have the obligation to provide these abstracts themselves. Special emphasis is placed on the completeness of the list of references of articles where the experiment results can be found.

The database includes a full-text search capability to retrieve information on experiments in a certain discipline, subject, mission, or by investigator name. The EEA covers both physical and life sciences, and can be found at the following URL:

<http://spaceflight.esa.int/eea/>

This database includes also a large number of pictures, as well as video sequences documenting experiment abstracts.

Scientists in Europe who have performed experiments, be it in orbiting or ground-based facilities (drop-tube, drop-tower, parabolic flights, sounding rockets, Foton capsules, the Space Shuttle or the ISS), are urged to either provide an abstract on each of their experiments, or to provide information enabling the updating of their existing abstracts, in particular the list of articles published.

An abstract features the following contents:

- Mission Name and Date
- Team Members and Affiliations
- References
- Processing facility
- Experiment Objectives

- Experiment Procedure and Results
- Attachments

Proposers will be requested to e-mail the new abstracts or the updated information for already existing abstracts to the EEA Curator (Nicole Sentse, ESTEC).

3.3.5 Acknowledgement

Any publication on the results generated during the studies solicited in this AO must acknowledge the sponsorship of the study by ESA, IPEV and PNRA S.C.r.l..

3.3.6 Support of Education and Outreach

The activities covered in this AO provide an opportunity for ESA to enhance and broaden the public's understanding and appreciation of Human Exploration related research facilitated by ESA's Human Spaceflight Directorate. Therefore the investigators of selected experiments are expected to promote and communicate their experiments to a wide audience (general public, colleagues, involvement of students) and to support ESA in the event of organised press conferences, educational events, publications etc.

4 Proposal Preparation Guide

4.1 Contact

For questions related to this Announcement of Opportunity please contact

Oliver Angerer
ESA/ESTEC
Tel. +31 71 565 3728
Announcement-specific email: Concordia@esa.int

For technical questions related to the submission website please contact
EsaPeerReview@esf.org

It is planned to organise a proposal workshop in connection to this research announcement on 2nd March 2010. The workshop will take place at ESTEC, Keplerlaan 1, Noordwijk, The Netherlands. This will be an opportunity to clarify potential questions or gather contacts for cooperative research projects. Please indicate your interest in participating in this workshop to the abovementioned contact email, for planning, registration and logistical information distribution purposes, at the latest by 22nd of February 2010.

4.2 Time Schedule

Letter of Intent due:	22 nd February 2010
Proposal workshop	2 nd March 2010
Proposals due:	12 th April 2010

4.3 Letters of Intent

To facilitate timely proposal processing (e.g. organisation of peer review), potential investigators are requested to confirm their plans to submit a proposal in response to this announcement. The Letter of Intent is not binding.

A letter of intent (Lol) is requested by 22nd February 2010. Lols should be submitted online through the European Science Foundation (ESF) web site. The online submission form can be found at

<http://www.esf.org/loi/concordia>

The Lol online form requests the following information:

- Science Team Coordinator's (STC) contact details and institution
- Science Team Members' (STM) contact details and institutions
- Project Title, acronym
- Project Summary
- Keywords and research area(s)

4.4 Proposals and Funding

If it is necessary for researchers to reach Concordia station to set up their experiment, the cooperating organisations will cover costs for travel and logistical

needs (clothing, food, etc.) from either Hobart or Christchurch. In this case a good justification for the necessity of the work to be performed at Concordia has to be included in the proposal. Access cannot be guaranteed and will be granted on a case-by-case basis.

If it is decided that it is scientifically justified for a scientist to travel to Concordia, he/she will have to pass medical tests, following the usual practice of IPEV and PNRA S.C.r.l..

Transportation of necessary equipment is covered in the same way, from “the last port”. The cooperating parties might offer special transportation on a case-by-case basis.

However, ESA and its partners do **not** financially support the work of selected experimenters. Any additional expenses related to the proposed work of an experimenter, including costs for travel (e.g. to meetings) and subsistence, are considered investigator-related costs, which are not sponsored by ESA. Co-funding from national agencies / organisations, universities, or other institutions is required to cover investigator-related costs. ESA strongly advises STC/STMs to submit their proposal to their national bodies in parallel with their application in response to this AO, in order to commence applying for national funding as early as possible. If the proposed experiment is selected a proof of appropriate funding is mandatory before commencing implementation of the proposals.

4.5 Proposal Submission

Proposals must be submitted online through the European Science Foundation (ESF) web site by 12th April 2010. The online submission website can be found at

<http://www.esf.org/concordia>

The online submission process includes several steps.

Proposers will be asked to fill in online the names and full contact details of the Science Team Coordinator and all Science Team Members, specifying the members' institutional affiliations. Mandatory fields are specified in the online form. A signature version of this form will not be requested. Furthermore proposers must provide an abstract and proposal acronym, and specify relevant keywords and research areas. The information requested in this part of the form is essential to the review of the proposal.

The information submitted will then be saved by the system. Proposers will then be required to upload their proposal. The saved information and the uploaded proposal will then be automatically merged and forwarded to proposers. This document, stored in the ESF database, will represent the reference document for future queries.

All proposals to be uploaded must be contained in one single and non-protected pdf document, not exceeding 8MB in size, using the proposal template provided on the ESA Concordia AO website, covering the following material, in this order:

- Project Description
- Management Approach
- Biographical Sketches
- Supporting Budgetary Information
- Ethics & Safety
- Experiment Data Sheet

4.5.1 Project Description

The length of the Project Description section of the proposal should not exceed twenty (20) pages using regular (12 point) type. The proposal should contain sufficient detail to enable a reviewer to make informed judgments about the overall merit of the proposed research and the probability that the investigators will be able to accomplish their stated objectives. The proposal should clearly indicate the relationship between the proposed work and the research emphasis defined in this Announcement of Opportunity. The development of a clear hypothesis, along with the available data evidence, should be emphasized in this section.

4.5.2 Management Approach

Each proposal must specify a single Scientific Team Coordinator, who is responsible for carrying out the proposed project and coordinating the work of other personnel involved in the project. The scientific institution for which the coordinator of a proposal is working must be located in one of the ESA member or associated member states that contribute to the ELIPS programme: **Austria, Belgium, Canada, Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland.** Scientists from ESA Member States that do not contribute to the ELIPS Programme (presently Finland, Portugal, Luxemburg and the United Kingdom), and scientists from other European countries having a cooperation agreement with ESA, are encouraged to enquire with their national space organisation about the conditions for their participation in proposals to ESA.

While it is not a formal requirement, it is, due to the organisation of Concordia operations, highly recommended that the research teams include French and/or Italian scientists.

In proposals that designate several senior professionals as key participants in the research project, the management approach section should define the roles and responsibilities of each participant, and note the proportion of each individual's time to be devoted to the proposed research activity. The proposal should state clearly and unambiguously whether the key personnel have reviewed the proposal and endorsed their participation.

Despite the fact that cooperative research proposals are favoured, big clusters of research proposals are not welcome because of the difficulty for the peer reviewers to make their judgement and later on the difficulty of implementation with the other selected protocols.

The STC is the main ESA point of contact for a team and must participate in the conduct of the research. He/she is responsible for direct supervision of the work and efficient communication among STMs.

4.5.3 Biographical Sketches

A short curriculum vitae (not exceeding 3 pages) of the Science Team Coordinator, which includes her or his current position, title and educational background, list of principal publications (up to 20), and any exceptional qualifications should be included. Give similar biographical information on other senior professional personnel who will be directly associated with the project (STM). Universities should list students or other assistance involved, together with information as to their level of academic achievements. Any special industry-university cooperative arrangements should be described.

4.5.4 Supporting Budgetary Information

Please describe briefly the status of (co-)funding availability and/or applications.

4.5.5 Ethics & Safety

A statement from the proposal's institution is required which states that the proposed work will meet all local human subject requirements if applicable. A letter signed by the chairperson of the local Institutional Review Board (IRB) regarding approval of the experimental protocol and using human subjects, should be included with the proposal. In addition, the proposal must be compliant with applicable European laws and guidelines for human biomedical research. If due to the timing of IRB meetings a final approval letter should not be available by the proposal submission deadline, the ethics approval application status should be described. In those cases, the final approval letter needs to be provided after the deadline, in order for the experiment to be considered for implementation.

Safety hazards and assessments, including a description of possible hazardous situations for the test subjects, must be provided.

4.5.6 Experiment Data Sheet

Please fill the details of your experimental protocol in the Experiment Data Sheet form that is part of the Proposal template.

ANNEX A: Long Term Medical Survey (LTMS)

Objective

The objective of the LTMS initiative is to collect regularly, in a defined scheme physiological and psychological parameters in the winter-over crews at Concordia station, in order to develop over the years a knowledge base regarding the adaptation of human beings in that extreme environment.

Currently Collected LTMS Parameters

The following measurements/instruments are currently being collected from the Concordia overwintering crews.

Measurement	Conducted by	Frequency	Duration
Med Officer record of maladjustment manifestations	MD	Twice a month	80 min (16x5)
Self record of maladjustment manifestations	Expeditioners	Once per month (during MD consultation)	5 min
Periodical self assessment (a few simple parameters (mood, physical well being, nutrition satisfaction, sleep, performance, interpersonal relationships)	Expeditioners	Twice a week	5 min
Leader and MD evaluations	Expeditioners	Once a month	20 min (for all 16)
Log of critical incidents	Leader+MD	When applicable	
Self assessment (mood)	Administered by MD, performed by expeditioners	PANAS every 2 weeks POMS 3 times during stay	2-3 min 8 min
Clinical symptom list (Lake Luise AMS-score)	Expeditioners	Daily during the first week, weekly after that for the rest of the first month, then once per month	30 sec each

ANNEX B: Available LTMS Data

Concordia 1

During Concordia 1, the medical doctor (MD) in charge of the LTMS data collection recorded the following data (data recorded on tables or scanned tables):

Psychological data:

- ARAD, record of maladjustment manifestations (by the MD), twice a month during the isolation period.
- Periodical self assessment (by the subjects), once a week during the isolation period
- MD periodical assessment (by the MD), once a month during the isolation period
- Mood self assessment
 - o PANAS every second week during the isolation period
 - o POMS 3 times during the isolation period

Physiological data:

- Lake Louise AMS-score (twice a month)
- blood pressure (once a month)
- heart rate (once a month)
- weight (once a month)
- arterial oxygen saturation (once a month)

Concordia 2

During Concordia 2, the medical doctor in charge of the LTMS recorded the following data (data recorded on tables or scanned tables):

Psychological data:

- ARAD: record of maladjustment manifestations (by MD), twice a month during the isolation period.
- Periodical self assessment (by the subjects), during the isolation period, twice a week in March and once a week after.
- MD periodical assessment (by the MD), once a month during the isolation period
- Mood self assessment PANAS and POMS
 - o POMS: 3 times during the isolation period
 - o PANAS: No data.

Physiological data: No data.

Concordia 3:

During Concordia 3, the medical doctor in charge of the LTMS recorded the following data (only raw data on paper):

Psychological data:

- ARAD: record of maladjustment manifestations (by MD), twice a month during the isolation period
- Periodical self assessment (by the subjects), once a week during the isolation period

- Leader periodical assessment (by the leader), once a month during the isolation period
- Mood self assessment PANAS and POMS
 - o PANAS: every second week during the isolation period
 - o POMS: 3 times during the isolation period

Physiological data: No data.