Background

Since 2001, ESA has been cooperating with the French Polar Institute (Institute Paul Emile Victor, IPEV) and the Italian Antarctic Programme (Programma Nazionale di Ricerche in Antartide, PNRA) on Human Research activities carried out at the Antarctic station, Concordia. Examples of this cooperation include a common research announcement for human research, the adaptation of technologies for grey water recycling to Concordia, which ESA originally developed for spacecraft life support systems (operating flawlessly since March 2005), and long-term medical, psychological and microbial monitoring.

In view of ESA’s future plans for human long-duration exploration missions, Concordia station acts as a powerful analogue for these future missions, as it replicates many of the expected conditions of a Lunar or Martian base. Such conditions include isolation, confinement, high levels of autonomy and social monotony, limited resources, restricted access by outside help in case of emergencies and a hostile external environment.

In order to support the implementation of scientific activities in the area of human research, ESA is looking for a medical doctor to join the next Concordia winter-over crew (leaving in the November 2019 timeframe).

Concordia Station

Concordia station is a permanent international research facility at high altitude on the Antarctic ice cap. The station was built by IPEV and PNRA S.C.r.l. The station has been permanently crewed since November 2004.

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

The area in which Concordia station is located is considered to be one of the most hostile places on Earth.

Some characteristics of the extreme environment include:

- An altitude of 3200m, equal to an altitude of almost 4000m at the equator. As such, air pressure is 645 hPa and results in chronic hypobaric hypoxic stress.
- The time from mid-February to mid-November is considered the winter period with the summer-period lasting the rest of the year. Access to the station is only possible during the Antarctic summer season.
CALL FOR CONCORDIA RESEARCH MD

- Overall mean temperature is -51°C, with a mean value of -30 °C during summer and -60 °C during winter (the lowest recorded temperature in Antarctica was recently found to be -97.7°C).

- The landscape is “completely” flat.

Further details on Concordia Station can be found at http://www.esa.int/Our_Activities/Human_Spaceflight/Concordia

Challenges

The challenges for a winter-over crew at Concordia are manifold. They include but are not limited to:

- Prolonged isolation and confinement (typical duration of a stay in the station is 12-13 months).
- A fascinating, but hostile natural environment (extreme low outside-temperatures, chronic hypobaric hypoxia).
- Autonomy: the crew needs to be autonomous and self-dependent especially from February to November, where no access to and from the station is possible, even in emergencies.
- Life in a small multicultural setting (typically 12-14 crewmembers, with French and Italian as the main spoken languages and a variety of behavioural customs).
- Limited mobility outside of the station buildings, especially during winter.
- Night/Daylight variations (constant light in summer, constant darkness in winter).
- Managing life with limited resources and in consideration of the environment.
CALL FOR CONCORDIA RESEARCH MD CANDIDATES

In order to implement ESA-selected human research activities at Concordia, ESA and the operators of Concordia release a call for candidates for a medical doctor as part of the next Concordia winter-over crew of 2020.

Tasks will include (non-exhaustive list):

- Training for the implementation of human research experiments before departure at the respective home laboratories of selected experimenters.
- Participation in the pre-departure meeting (one week in October), including briefing fellow crewmembers about the planned ESA human research programme.
- Implementation of ESA-selected research experiments during the stay mainly in the areas of psychology, physiology and microbiology.
- Routine reporting on the status of the implementation.
- Sampling and analysis of recycled water.
- Participation in the normal shared tasks of the station (housekeeping).
- After the stay, providing a debriefing report ("lessons learned").

It is expected that the selected candidate will also participate as a test subject in the ESA Human Research experiments. However, for the other crewmembers, this participation is voluntary and can be stopped at any time without consequences. Informed consent will be collected from participating crewmembers prior to departure.

The selected candidate will not be responsible for the operational medical provision for the crew, but can support the Crew Medical Doctor if the need arises.

Candidate Profile:

- Medical doctorate and work experience
- Strong interest in medical and psychosocial research
- Laboratory /research experience
- Very good English language skills are essential; French or Italian language skills are desirable
- Excellent health
- No addictions
- Nationality and residence in one of the ESA member states (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, United Kingdom) or the ESA associated states (Canada and Slovenia).

Additionally, as a benefit:

- Experience in wilderness/extreme environments medicine and other outdoor experience
- A space-related background

The position will be implemented via a contract with the French Polar Institute, IPEV. The final salary amount will depend on the exact contract duration (approximately 18 months in total). It shall be noted that Concordia-specific factors such as transport, special clothing, communication facilities etc. will be provided by the Concordia partners.
CALL FOR CONCORDIA RESEARCH MD CANDIDATES

Please send your CV and a letter of motivation to:

Concordia@esa.int

(Questions before application should be sent to the same address)

Process and timeline

Deadline for applications: 14th January 2019.

Based on the Motivation Letters and CVs, 3-5 candidates will be invited for a thorough medical examination, psychological assessment and interview to Paris around the March 2019 timeframe. The final selection will be made as soon as the results from all medical tests are available.

Investigator Working Group meeting: May/June 2019
Training: Summer 2019
Pre-departure meeting: One week in the first half of October 2019.
Return between the end of 2020 and early 2021.
Post-mission Baseline Data Collection: May/June 2021