

Full Proposals for International Polar Year 2007-2008 Activities

Proposed IPY Activity Details

1.0 PROPOSER INFORMATION

(Activity ID No: 41)

1.1 Title of Activity

Concordia, a new French-Italian facility for international and long-term scientific activities on the Antarctic Plateau

1.2 Short Form Title of Proposed Activity

CONCORDIA

1.3 Activity Leader Details

Frenot Yves
Concordia Steering Committee
France - Italy

1.4 Lead International Organisation(s) (if applicable)

NULL
NULL
NULL
NULL

1.5 Other Countries involved in the activity

Germany
NULL
NULL
NULL
USA
NULL
NULL
NULL
Australia
NULL
NULL
NULL
Finland
NULL
NULL
NULL

1.6 Expression of Intent ID #'s brought together in this proposed activity

888

1.7 Location of Field Activities

Antarctic

1.8 Which IPY themes are addressed

1. Current state of the environment
2. Change in the polar regions
3. Polar-global linkages/tele-connections
4. Exploring new frontiers
5. The polar regions as vantage points

1.9 What is the main IPY target addressed by this activity

4. Legacy

2.0 SUMMARY OF THE ACTIVITY

While there is an increasing awareness of the importance of Antarctic research, the 14 million km² Antarctic continent still only houses two permanent inland research stations, Amundsen-Scott and Vostok. Recognizing the unique research opportunities offered by the Antarctic Plateau, the French and Italian Antarctic programmes agreed in 1993 to cooperate in developing a permanent research support facility at Dome C. The new station, named "Concordia" (75°06' S -123°23' E), opened for wintering in 2005. However, the two first years will be mainly dedicated to the completion of the buildings, tests of safety protocols and settlement of some scientific equipment. For this reason, Concordia is expected to be fully operational when the International Polar Year starts, in 2007. Dome C has several valuable characteristics that support the installation of a permanent scientific station:

-A substantial layer of ice, about 3,300m thick, offers great potential for paleo-climatic reconstruction. Ice cores were collected by the EPICA program, a European project involving 10 countries, and more than 900,000 years of climatic records are expected from these samples. In addition, numerous small and medium-sized sub-glacial lakes have been detected in vicinity of Concordia, giving opportunities for exploration and tests of new technologies for the study of such extreme and unique environment.

-The area corresponds almost to the centre of the polar vortex, a major component of the Antarctic Oscillation driving the heat and mass exchanges between the Antarctic continent and the surrounding ocean-sea-ice-atmosphere coupled system. This area is also suitable for studying the ozone depletion and the subsequent cooling of the stratosphere in spring.

-The Concordia station is a vantage central Antarctic site to analyze polar meteorological high-resolution data and to evaluate the performance of satellite instruments in terms of local and large scale circulation, surface meteorology and processes, boundary layer and free atmosphere meteorological profiles.

-The Antarctic Plateau is a well recognised, favourable site for astronomic observations due to its geographic location and its extremely dry, cold, rarefied and stable atmosphere.

Millimetric/microwave polarimeters can exploit their high sensitivity in Dome-C, rivalling with space based instruments in selected sky areas. Dome-C is the only built location on the Earth where the 200 micron window is usable; the extremely low atmospheric emissivity will also allow optimal use of the other mm/sub-mm atmospheric windows for Galactic, Extragalactic and Cosmological studies. The site is also extremely favourable for infrared astronomy.

-Dome C is a particularly promising location, at critical distance from highly active seismic regions, to allow optimal sampling of the deep mantle and the core in crucial geometries. Besides, it is situated on the East Antarctic plateau about 1,000 km away from the coast in a site potentially very quiet and therefore ideal for seismographic observations.

-Dome C, at 3,233m above the continental crust, is protected from any magnetic perturbations by earth crust anomalies and is an ideal place for studying geomagnetism.

-Concordia is also a unique place to study the Solar-Earth relations within the particular polar cap region, and to understand their symmetrical and asymmetrical properties with respect to the Northern hemisphere

-Dome C is as a very isolated site with severe climatic conditions. It will be an excellent site for evaluating techniques and procedures for future work on other planets. It is also an excellent site for studying bio-medical and psychological problems of small groups of people in conditions

close to those encountered in space vehicles or orbital stations.

So, Concordia Station will be a new earth observatory and a logistic centre permitting the exploration of the East Antarctic plateau and giving opportunities to deploy new technical challenges and international projects.

2.1 What is the evidence of inter-disciplinarity in this activity?

See above the potentialities of the site of Dôme C in glaciology, paleoclimate, tropospheric, stratospheric, and ionospheric sciences, sun-earth relations, astronomy, geomagnetism, seismology and human medicine (including psychological studies). In addition, this station provides the opportunity to develop new technologies related to cold regions and to remote and inhospitable areas.

2.2 What will be the significant advances/developments from this activity? What will be the major deliverables? What are the outputs for your peers?

Concordia Station and the surrounding facilities have been conceived to be a long term support to valuable international scientific programmes. In Antarctica, most of the scientific activity is confined to coastal areas; so, the geographical location of Concordia is a unique vantage to provide new data in the global network for many sciences (geomagnetism, seismology, atmospheric sciences ...) and to increase the accuracy of several models in climatology and atmosphere chemistry. These data, combined with the paleoclimatic records obtained from the ice cores, will improve our knowledge of the Antarctic environment, its changes during the last million years, and its links and interaction with the rest of the planet. In addition, the exceptional quality of the site for astronomy allows developing programmes cheaper than from satellites or orbital stations.

So, Concordia station will offer to the international scientific communities the possibility to develop sound researches in one of the most unknown region in the world, region which plays a significant role at the global level, namely in term of climatic processes.

2.3 Outline the geographical location(s) for the proposed field work (approximate coordinates will be helpful if possible)

Locations	Coordinates
Concordia Station and its surroundings, Dôme C	75°06' S -123°23' E

2.4 Define the approximate timeframe(s) for proposed field activities?

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
	03/07 - 03/09

2.5 What major logistic support/facilities will be required for this project?

New field station

Helicopters

Snow terrain vehicles

Further details – Concordia Station is an Italian-French facility which is supported and funded by the two national polar operators (PNRA and IPEV). This support includes not only the station functioning but also the associated logistics (ships, aircraft, traverses...) and partially the cost of the scientific programmes.

2.6 How will the required logistics be supplied? Have operators been approached?

Source of logistic support	Likely potential sources	Support agreed
Consortium of national polar operators		Y
Own national polar operator		Y
Another national polar operator		
National agency		Y

Military support		
Commercial operator		
Own support		
Other		

2.7 If working in the Arctic regions, has there been contact with local indigenous groups or relevant authorities regarding access?

3.0 STRUCTURE OF THE ACTIVITY

3.1 Origin of the activity

This activity is the start of a new programme that will outlive IPY

3.2 How will the activity be organised and managed? Describe the proposed management structure and means for coordinating across the cluster

France (IPEV) and Italy (PNRA) will jointly operate the station according an agreement defining the structure of the management team (in Italy, in France and in the field), the scientific evaluation procedure of the submitted proposals, and the sharing of costs. These two organizations have a great experience in such polar activity in Antarctica (Italy operates Mario Zucchelli station and France operates Dumont d'Urville station). A Steering Committee will be established with 4 members: the two directors of IPEV and PNRA, and two members nominated by the Italian and French Ministers of Research, respectively. An Executive Director will be nominated by the Steering Committee for the next 4 years (including the IPY period). He will be responsible for the activities on the site of Dôme C and for the station itself. He will evaluate the logistical feasibility of the scientific projects. A Scientific Committee will evaluate the value of the proposals. It will be made of 9 experts, 3 Italians, 3 French and 3 from other countries. This scientific committee will be helped by the Steering Committee for the logistical and technological projects. At Concordia, a field leader will be in charge of the operations during the summer season and the wintering-over and of the implementation of the scientific programmes. Scientists from other countries who want to work at Concordia are welcome; they are encouraged to develop collaborations with French and Italian laboratories.

3.3 Will the activity leave a legacy of infrastructure and if so in what form?

Concordia Station has been built for several years. The IPY will be the start of this new station on the Antarctic plateau and its life will obviously outlive the event. In term of legacy, France and Italy offers to the international community a new tool for research in a very remote and unknown region.

3.4 Will the activity involve nations other than traditional polar nations? How will this be addressed?

At this stage, the nations involved in the Concordia project or in the associated scientific programs are all traditional polar nations. However, collaborations between scientists using these new facilities are encouraged.

3.5 Will this activity be linked with other IPY core activities? If yes please specify

Yes, most of the scientific programmes mentioned in this document are involved in other IPY project, more directly related to science. For example, projects in glaciology (sub-glacial lakes, ground traverses...), in atmospheric sciences (ozone, aerosols...), astronomy etc... are also parts of different clusters. The current proposal focuses only on the station itself, its facilities and its potentialities for science.

3.6 How will the activity manage its data? Is there a viable plan and which data management organisations/structures will be involved?

It is the responsibility of scientists to make their data available for the largest community. From the operator side, the station will be equipped with all facilities allowing the rapid transmission of

the information.

3.7 Data Policy Agreement

Will this activity sign up to the IPY draft Data Policy (see website)

Yes

3.8 How will the activity contribute to developing the next generation of polar scientists, logisticians, etc.?

Concordia station remains one of the most remote and inhospitable place in the world. For many reasons, it is an exceptional attracting site for the public, as demonstrated by the interest of many medias and schools during the building stage. In France and Italy, the public is aware of this project by several newspaper articles, TV or radio programmes. No doubt that such publicity, increased during the IPY, will promote new vocations within the young generations.

3.9 How will this activity address education, outreach and communication issues outlined in the Framework document?

Outreach and communication issues have been a major concern of Italy and France during the building stage of the station and the scientific programmes developed at Dôme C in summer. Several radio, TV journalists and journalist for the written press have been invited on the site during the last years. Most of these medias (from magazines for children to national TV channels) are expressing their interest to cover the first years of Concordia. In addition, several projects have been submitted to IPEV and PNRA for exhibitions or cultural events related to Concordia Station during the IPY. If these projects have not been directly submitted to the IPY JC, most of them may receive in due time the support of IPEV and PNRA.

3.10 What are the proposed sources of funding for this activity?

Building of Concordia station has been already funded by France and Italy. The cost of exploitation of the station will be shared between France and Italy according the agreement signed between the tow countries. Funding will come exclusively from national agencies.

3.11 Additional Comments

Our agreement with the IPY Data Policy concerns only the activities which are naturally under the responsibility of national operators in Antarctica. We cannot engage our responsibility for the scientists working at Concordia. However, we can provide to the IPY community the metada related to all the activities (science, logistics, technology). The Concordia station is endorsed by the French and Italian IPY Committees. In addition, related scientific projects which are integrated to other IPY cluster will receive also the support of these two national committees.

4.0 CONSORTIUM INFORMATION

4.1 Contact Details

Lead Contact

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4.2 Other significant consortium members and their affiliation

Name	Organisation	Country
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