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INVITATION FOR INNOVATIVE RESEARCH PROPOSALS 40th INDIAN SCIENTIFIC EXPEDITION TO ANTARCTICA (40-ISEA)

National Centre for Polar and Ocean Research, an Earth System Science Organization (ESSO-NCPOR & erstwhile NCAOR), under the Ministry of Earth Sciences (MoES), Government of India, is the nodal agency for implementation of the Indian Antarctic Programme. Hitherto, thirty-nine scientific expeditions to Antarctica have been successfully completed. The fortieth Antarctic Expedition, scheduled to be launched in October-November 2020 is being initiated through this advertisement.

The 40th Indian Scientific Expedition to Antarctica (40-ISEA) embarks on a new journey of scientific research. ESSO-NCPOR welcomes long-term innovative scientific proposals in thematic areas and its sub-themes in different disciplines. In addition to the ongoing programmes of different institutions, ESSO-NCPOR welcomes scientific projects under the following broad areas with area of focus being Amery Ice Shelf in Prydz Bay region for multi-national, multi-institutional programme with special reference to geoscientific program viz identification of orogenic and cratonic components to arrive at a refined India-Antarctica geological correlation as detailed in Annexure I.

I. Climate Processes and Linkages to Change

- a) Antarctic ice-sheet and Sea-level rise
- b) Sea ice monitoring and modelling
- c) Antarctic Atmosphere / Southern Ocean teleconnection to Tropics
- d) Paleoclimate (Ice and sediment core)
- e) Surface Processes and Landscapes

II. Crustal evolution

- a) Reconstruction of sub-ice geology
- b) Early earth and evolution of earth
- c) Heat flow modelling for EAIS behaviour
- d) Geological Exploration of Amery Ice Shelf (GeoEAIS) *see Annexure I*

III. Environmental Processes and Conservation

- a) Trends and sensitivity to change
- b) Human interventions: mitigation and prevention

IV. Ecosystem of Terrestrial and Nearshore

- a) Lake biogeochemistry and productivity
- c) Microbial diversity
- d) Polar biodiversity
- e) Wildlife

V. Observational Research

- a) Atmospheric observations including climate reference stations
- b) Coastal ocean observatories (Prydz Bay) and deep ocean mooring
- c) Ionospheric studies / Space weather / Atmospheric electricity
- d) GPS networks / Seismological observation
- e) Hydrographic survey / Bathymetry
- f) Topographical and geological mapping
- f) Satellite Communication and Remote sensing
- g) Stellar observations

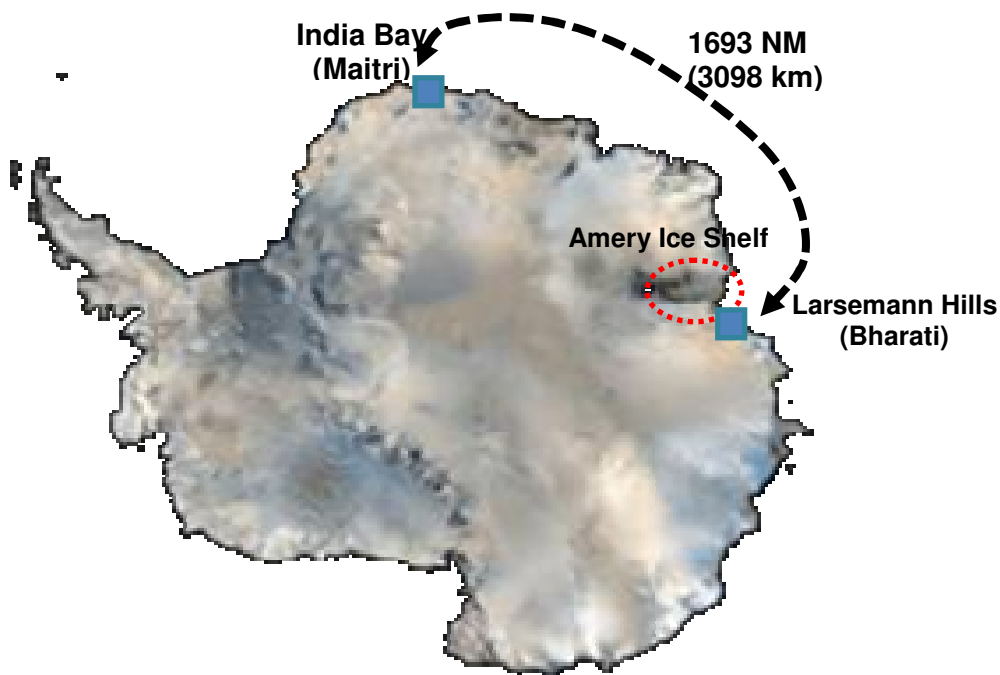
h) Human Physiology

VI. Polar Technology

- Development of autonomous vehicles, moorings and platforms
- Drilling technology
- Communication and Energy conservation

1. Area of operation

ESSO-NCPOR operates two-year-round stations in Antarctica, which are ~ 3000 km apart.



- MAITRI** research base ($70^{\circ}45'58''\text{S}$; $11^{\circ}43'56''\text{E}$) is located in Schirmacher Oasis of Central Dronning Maud Land. It is an inland station nearly 100km from the edge of the ice-shelf (Indian Barrier for Ship)
- BHARATI** research base ($69^{\circ}24.41'\text{S}$, $76^{\circ} 11.72' \text{E}$) is located in Larsemann Hills of Ingrid Christensen Coast. It is located off the Quilty Bay (~ 200 m from the coast).
- SHIP BOARD OPERATIONS** can be proposed during the course of voyage from Cape Town - Bharati – Maitri - Cape Town transect.

[Considering the distance between two stations- Maitri & Bharati; and logistics involved, scientific proposals are expected to be well thought out and viable]

2.0 TRAVEL

Travel arrangements for all expedition members from Goa to Antarctica and back is taken care of by ESSO-NCPOR.

2.1 Travel Season for Antarctica

- Air operations between Cape Town and Maitri, between Maitri and Bharati are possible only in the summer season i.e. between November and February on pre-decided days.
- Ship operation between Cape Town and Bharati/ Maitri depending on the voyage plan for the season is possible from November to March of succeeding calendar year.

2.2 Mode of Travel

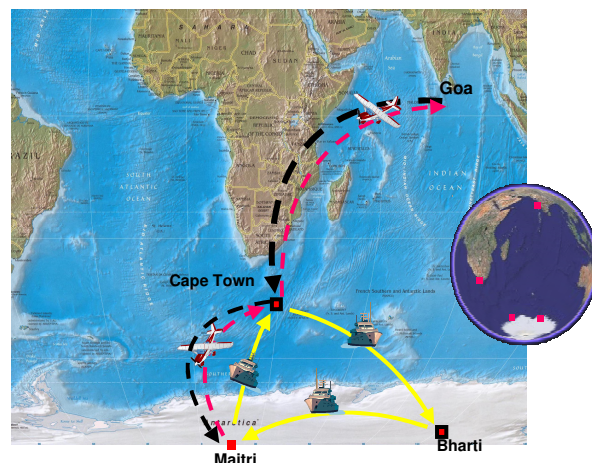
- 2.2.1 **By air:** Goa to Cape Town and back (Commercial airlines); Cape Town- Maitri-Bharati (through chartered flights under the aegis of DROMLAN initiative)
- 2.2.2 **By sea:** Cape Town-Bharati-Maitri-Cape Town (by ship/s on ESSO-NCPOR charter vessel).

[It's important to note that the mode of travel is not by choice but based on the time of travel, destination and nature of project]

2.3 Travel Time

- 2.3.1 **By air(Inter-continental):** Cape Town to Maitri & vice versa takes ~ 6 hours by Ilyushin-76 (IL-76) aircraft. Flight timings and dates can be advanced/postponed subject to weather conditions in Antarctica.

- 2.3.2 **By air (Intra-continental):** Travelling by air between Maitri and Bharati through chartered Basler/Twin Otter aircrafts (12 seater). The seating may vary depending upon passengers and cargo. These aircrafts require midway fuelling and takes nearly 10-12 hours. It is expensive and needs prior planning for availability of aircraft and midway refuelling.



Note: There are no direct chartered flights between Cape Town and Bharati. Bharati by air is connected only via Maitri.

- 2.3.3 **By sea:** The general Voyage route is Cape Town-Bharati-Maitri-Cape Town. The route maybe changed based on expedition objective.

Leg I: Cape Town to Bharati– Direct connection is only through ESSO-NCPOR's chartered ships that take 10 to 12 days depending on the weather and sea-ice conditions.

Leg II: Bharati to Maitri - By ship it takes 5 to 7 days depending on the weather and sea-ice conditions.

Leg III - Maitri to Cape Town:By ship it takes 8-12 days depending on the weather and sea-ice conditions.

3.0 Stay in Antarctica

ESSO-NCPOR operates two year-round stations Maitri and Bharati for scientists to carry out research activities. Entry and exit to Antarctica due to its peculiar geographic position is restricted between November to March of the succeeding calendar year.

Scientists participating in the 40th Indian Expedition, desirous of working only through the summer season can embark Antarctica in October-November' 2020 and return by February-March' 2021 and those proposing for winter season duration will continue their stay in Antarctica only to return between November' 2021 to March' 2022

4.0 Infrastructure facility

4.1 Maitri

- 4.1.1 Living Capacity: Winter– 25

Around 25 Expedition members for long-term can be accommodated in the main building of Maitri station.

4.1.2 Living Capacity: Summer – 40

Expedition members for short-term can be accommodated in the summer facility comprising of containerised living modules. Each container can accommodate four expedition members.

4.1.3 Laboratory space.

There is limited containerised/ modular laboratory space available. Members have to carry their items of equipment / chemicals/ sample collection, storage & transportation devices. In case of large space requirements for any instrumentation both in terms of logistics and power consumption, the same should be spelt out in detail and also presented and discussed during the presentation at NCPOR.

4.1.4 Inland transport

4.1.4.1 Helicopters

Ship based helicopters are available for scientists working in the field. The helicopters are available only when the ship is around Maitri (at the Indian Barrier). Need based heli support shall be provided. Projects with intensive helicopter requirements should spell out the details in advance.

4.1.4.2 Snow Vehicles

Snow vehicles (Pisten Bully & snow scooters) are available round the year. However, requirement details need to be spelt out in advance.

[In view of the available infrastructure, the proposed scientific work should be confined within the logistic reach, ideally not exceeding 100 km from station in campaign mode]

4.2 Bharati

4.2.1 Living Capacity – 47 - Summer & Winter

All expedition members will be accommodated in the main building of Bharati Station

4.2.2 Laboratory – 270 Sq feet of laboratory space is established with regulated power supply. Laboratories are augmented with some basic equipment such as Laminar Air Flow, Milli-Q Ultra purification water system, Ultra-Sonicator, Autoclave, Hot Air Oven, Muffle Furnace, electronic weighing balance, thin section preparation device, rock cutting equipment etc.

4.2.3 Inland transport

4.2.3.1 Helicopter/s

The helicopters are available only when the ship is around Bharati (Quilty Bay). Ship based helicopter/s are available for scientists working in field. Projects with intensive helicopter requirements should spell out the details in advance.

4.2.3.2 Snow Vehicles

PistenBully vehicles and snow scooters are available round the year. However, requirement details need to be spelt out in advance.

[In view of the available infrastructure, the proposed scientific work should be confined within the logistic reach, ideally not exceeding 100 km from station in campaign mode.]

4.3 Voyage based science

Scientific operations which can be done without stopping the ship can be carried out enroute voyage. The ship is a chartered cargo vessel (not a research vessel) and a separate lab space is not available.

The infrastructure support needed in Antarctica / during the voyage, should be spelt out in detail in the Project Proposal format and should be defended before the group of experts at the time of presentation of project proposal/s.

5.0 Communication facility available with the stations

Internet connectivity and e-mail facilities are available at both the stations.

ESSO-NCPOR also provides limited time for calling from the station and the ship. This communication is through satellite phones.

- Shorter duration (Summer period): 6 min/month
- Longer duration (Winter period): 20 min/month
- A common e-mail Id is provided on the voyage vessel for communication.

6.0 Eligibility for participation in the 40thISEA Expedition

For participating in the 40thISEA the proposer of the scientific project i.e. the Principal Investigator (PI) - should be a regular employee, with an interest/expertise in the relevant field.

The proposed personnel indicated in the scientific proposal for participation in the 40-ISEA should mostly be from PI's organization/institute/universities. In case of collaboration with other institute/department/organization, same should be explicitly mentioned. ESSO-NCPOR encourages scientific collaboration with other organizations/institutes/universities.

The proposals for the 40-ISEA should be submitted to ESSO-NCPOR through proper channel and duly endorsed by the head of the institution. In case of participation of two or more institutes, scientific proposal should have the consent from all the participating organizations/institute/universities.

The research proposals for the mentioned scientific programmes have to be submitted in the prescribed format "40-ISEA (2020-2021)" both as hard copy (by post) and soft copy (only in word format) on email (antarctic-sci@ncpor.res.in).

Proposals are invited for both short-term (summer) and long-term (winter) both for Maitri (Schirmacher Oasis) and Bharati (Larsemann Hills).

Preference will be given to long-term programmes resulting in meaningful scientific research with tangible results. Programmes with capabilities for online data acquisition and transmission are encouraged.

Last date for receiving application is 07-April-2020.

7.0 Process of selection

The PI should defend his/her research proposal submitted to ESSO-NCPOR during a workshop headed by a panel of experts as and when invited. It is currently scheduled for 13th & 14th May, 2020 [please check the dates, this can change]. All proposals should be scientifically and logistically viable.

PI/Co-PI should invariably defend the proposal in person at their own expense.

8.0 Things to do, on selection of the research proposal

8.1 Only those project proposal/s which get through the preliminary screening from reviewers, will be intimated on their selection for defence at NCPOR by 30-April- 2020.

The PI/Co-PI need to defend their proposals in front of a panel of experts during the National Workshop for selection of proposals for the Indian Antarctic Programme held during the second week of May.

8.2 All organizations to provide full personal details of participating individual within two weeks on receipt of the communication (of being selected) from ESSO-NCPOR on the prescribed form numbered AL-1208 by 10-June-2020.

The selected team members will have to undergo -

8.2.1 A detailed Medical Examination at the All India Institute of Medical Sciences (AIIMS), New Delhi. **Travel and stay at their own expense.**

8.2.2 Snow acclimatization training at the Mountaineering & Skiing Institute (ITBP), Auli, Uttarakhand. Exact dates will be communicated to medically fit members.

8.2.3 Members should apply for their own Official Passport with last date for submission to NCPOR on 1-September-2020 [for short term participation the passport should be valid until 30-September-2021 and for long term participation the validity should be 30-September 2022]

9. Team movement for Antarctica

Team Movement 40-ISEA (2020-21)

Air Travel to Maitri/ Bharati tentative schedule for season 2020-21

Departure from Goa	Nov-20 to Dec-20
Departure from Cape Town	Nov-20 to Dec-20
Arrival Maitri/Bharati	Nov-20 to Dec-20
Departure Maitri/Bharati	Dec-20 to Feb-21
Arrival Cape Town	Dec-21 to Mar-21
Arrival Mumbai/Delhi	Dec-21 to Mar-21

Expedition members shall be sent in and brought out of Antarctica in batches depending on availability of Ship/aircrafts and project requirements.

10. Scientific Cargo Movement:

The expedition cargo (including scientific cargo) is sent from Goa to Cape Town through commercial freight carriers/shipping lines. It takes nearly 45 days for the cargo to reach Cape Town including the lead time for customs formalities. For onward carriage to Larsemann Hills, Antarctica, the cargo will be shipped onboard the chartered expedition vessel.

10.1 PI's/Organizations should make sure that the scientific cargo must reach ESSO-NCPOR, Goa on or before 01-September-2020 (for air cargo) and 15-October-2020 (for voyage) else it could be left out and thus jeopardizing the programme.

10.2 Package dimensions for cargo transfer by air:

10.2.1 Members going directly to Maitri may carry their select scientific equipment/s by air (with prior intimation to the Logistic division at ESSO-NCPOR).

10.2.2 The size and weight of individual packaging/box/baggage should not exceed 90x72x45 cm (LHW) and 30 kg in weight.

10.2.3 Packaging shall be proper and airworthy preferably in steel/aluminum boxes and the dimensions of the individual units preferably not more than 30 kg in weight

unless its for some special scientific instrument. Scientific instruments in cartoon boxes are discouraged however consumables/labware/glassware etc. may be sent in factory packing. The packing should be tamper proof, safe against manipulation, Insulation must be provided for temperature variation (if required) resistant to weather factors; heat, rain, moisture, Wooden packing must be avoided for air transfer as it requires fumigation. Individuals have to carry suitable boxes (insulated/metal) for proper storage of samples required to be shipped from Antarctica to India. Also, may clearly mention the following details on each boxes;

- Expedition: Kindly mention expedition number, e.g. 40 ISEA
- Owner's Name: Name of the organization / Name of expedition member
- Final destination: MAITRI or BHARATI or VOYAGE (Choose appropriate destination)
- Box No: e.g. 1 of 5; 2 of 5; 3 of 5; 4 of 5; 5 of 5

Unsafe and unworthy packaging will be rightly rejected.

11.2.3 Any requirement for hazardous cargo like gases, chemicals, fuel, lithium-ion batteries, oil etc. needs to be intimated immediately upon approval of the project as the same cannot be transported by air and needs to be arranged at Cape Town.

11. Allowances for travel and stay in Antarctica

11.1 ESSO-NCPOR makes arrangements for travel to Antarctica from Goa and back. All logistics viz., accommodation in the ship and Antarctica, food, special polar clothing requirements and personal insurance cover will be provided by NCPOR.

11.2 All other expenses including those related to procurement of scientific equipments, attending pre-Antarctic training, arrival to Goa, Hard Duty Allowance etc., will have to be borne by the participating organization. This may be taken into account while forwarding the nominations. [HDA - Presently @ Rs. 1500/- and Rs. 2000/- per day for short-term [summer] and long-term [winter] respectively as per ESSO-NCPOR's terms and conditions]. Short-term / Summer season (1st December to 28th/29th February) and Long-term / Winter season (1st March to 30th November).

12. Conduct of Members

Members have to maintain discipline at the station, ship and air transit. The orders from the Leader in prioritizing things and any disciplinary matter are final.

13. Leader for 40-ISEA [Maitri, Bharati and Voyage]

Should the PI / participating member aspire to be the Leader of the 40-ISEA at Maitri, Bharati & Voyage: ESSO-NCPOR welcomes nominations from organizations for selection of the Leader for Maitri, Bharati and Voyage.

Candidates having leadership qualities with experience in Antarctic are preferred.

Letter of nomination addressed to The Director, ESSO-NCPOR along with bio-data and professional experience of the nominated candidate should be sent in a separate cover inscribed "Proposed Leader 40 ISEA- MAITRI / BHARATI & VOYAGE" (preference to be clearly indicated) by the Head of the organization.

14. Data Policy

Data in general and that from the polar region is precious in particular. The true value of scientific data is often realized long after it has been collected, and to ensure the lasting legacy it is essential to ensure long-term preservation and sustained access to Antarctic data.

Being the member of the Antarctic treaty, the data policy of ESSO-NCPOR is governed by section III.1.c of the Antarctic Treaty 1959 and has been broadly adopted from IPY 2012-13 (http://classic.ipy.org/Subcommittees/final_ipy_data_policy.pdf) keeping in view the interests of national and international scientific community.

All data generated during the voyage and/ or from the Antarctic continent under the aegis of Indian Scientific Expeditions accompanied by a full set of metadata that completely documents and describe the data is to be given to ESSO-NCPOR for secured archival in the National Polar Data Centre, on return to mainland.

In order to promote the data management within the Antarctic scientific community in accordance to the spirit of the Antarctic Treaty, the metadata (data about data) will be made available through ESSO-NCPOR website without any access restrictions and will be shared on the network established by the SC-DAM – Standing Committee on Antarctic Data Management of the Scientific Committee on Antarctic Research/Council of Managers of National Antarctic Programs (SCAR/COMNAP).

However, the data will be treated as intellectual property of the owner / collector with a lock-in period of 2 years from the date marking the end of the expedition season. This gives ample opportunity to the collector for analyzing the data, making full use of the information and in translating it to knowledge base. The mandatory lock-in period upon request is extendable to a maximum of five years depending on the nature, volume, sensitivity and reasonability of processing time required.

Upon the expiry of the mandatory or extended lock-in period, the data will be made available to the scientific community for free and open access with a rider that the name of the owner / collector will be duly acknowledged in any sort of technical report/ publications / short note / scientific and or administrative communiqué.

As per the IPY norms, the only exceptions to this policy of full, free, and open access are:

- Where human subjects are involved, confidentiality must be protected
- Where local and traditional knowledge is concerned, rights of the knowledge holders shall not be compromised
- Where data release may cause harm, specific aspects of the data may need to be kept protected (for example, locations of nests of endangered birds or locations of sacred sites).

15. Care for the Antarctic environment

Antarctica is a pristine environment and needs to be protected and maintained to the best of our ability. This is as part of the international treaty for embracing and protecting the earth as also the strict guidelines for research in Antarctica. There is an Environmental Policy in force and needs to be adhered in word and spirit (Details can be obtained from **www.ats.aq**).

16. Environmental Authorization and Permit

Permit requirement applies to Indian Antarctic Expedition members as well as other organizations undertaking activities within ASPA in the Antarctic Treaty Area through Indian Antarctic Expedition or part of it, including scientists, logistical personnel

Environmental authorization & permits required under Environmental protocol and for activities in & around the Indian Research base needs to be duly submitted by the researchers the details of which is available at

<http://www.ncaor.gov.in/pages/display/414-environmental-authorization-and-permit>. It must be submitted alongwith the proposal with copy to

17.Application Format for 40-ISEA

The application format may be downloaded from ESSO-NCPOR's website (www.ncpor.res.in)

Application will not be considered if the following are not provided

1. Dully filled application form
2. If you propose to work in the ASPA areas, you may submit the duly filled Environmental Clearance forms: PED 01, and PED 03. The details of which is available at <http://ncpor.res.in/antarcticas/display/414-environmental-authorization-and-permit>.

Deadline for receiving proposals

- Three copies of the proposal along with all essential endorsement and certificates in the prescribed formats [<http://www.ncaor.gov.in/antarcticas/display/319-participation-forms>] should be forwarded through proper channel and must reach the Director, Earth System Science Organization, National Centre for Polar & Ocean Research, Headland-Sada, Vasco-da-Gama, Goa- 403 804 latest by 07-April-2020. The envelope should be clearly super scribed "40-ISEA PROPOSAL".
- If there is any other participating organization involved in the proposal, an endorsement from their institute as also for collaborations sought should be part of the proposal and be explicit.
- The proposal should be submitted in MS-word format (Times New Roman Font; Size 12; 1.5 line spacing).
- A soft copy only in MS Word format should also be sent as an attachment by e-mail: antarctic-sci@ncpor.res.in with the Subject: "40 ISEA Proposal".

PI's should follow the norms strictly. Proposals received after 07-April-2020 will not be accepted.

- More details are available on our webpage

(<http://www.ncaor.gov.in/antarcticas/display/319-participation-forms>)

18. Important Deadlines

07-April-2020	Last date for receipt of application complete in all respect
07-April-2020	Last date for receipt of duly filled in permit application for working should if the project area falls partly or wholly under Antarctic specially protected Areas (ASPA) refers.no 19.
30-April-2020	Communication from NCPOR conveying status for initial screening of proposal
13 & 14-May-2020	Presentation for evaluation of project for inclusion
10-June-2020	Last date for receiving personal details of expedition members (use AL-1208 form)
01-July-2020	Last date for receipt of Nomination for Leader(s)
01-Sep-2020	Last date for receipt of Personal Passport
01-Sep-2020	Last date for receipt of scientific cargo immediately required during the expedition at Maitri/Bharati
01-Aug to 15-Oct, 2020	Tentative period for Medical &Auli Training between
15-Oct-2020	Last date for receipt of scientific cargo required during voyage or later for summer/winter period
November 2020	Departure for Antarctica in batches
For any queries, kindly write to antartic-sci@ncpor.res.in	

**GEOLOGICAL EXPLORATION OF AMERY ICE SHELF (GeoEAS)
IN
LAMBERT GLACIER/AMERY ICE SHELF (LG/AIS) REGION**

The Amery Ice Shelf (69°45'S 71°0'E) is a broad ice shelf in Antarctica at the head of Prydz Bay between the Lars Christensen Coast and Ingrid Christensen Coast. The area of this ice shelf is approximately 23,200 square miles (60,000 square km). Several glaciers in East Antarctica, including the Lambert Glacier, share the same route to the ocean through the Amery Ice Shelf.

ESSO-NCPOR is initiating new scientific research at Lambert Glacier/Amery Ice Shelf (LG/AIS) of East Antarctica. Ground work to setup a temporary base in this region has been initiated during the 39-ISEA. A summer base (operational only during the summer season) will be setup in the next couple of years to provide a platform to carry out research activities in the LG/AIS.

A multinational geoscientific program named as Geological Exploration in and around Amery Ice Shelf (GeoEAS) is currently being developed as the first major India-led initiative with following two major objectives:

1. Delineation of the major geologic units and structures in the Amery Ice shelf area and identification of orogenic and cratonic components to arrive at a refined India-Antarctica geological correlation
2. Providing inputs for the differential response of East Antarctic Ice Sheet (EAS) versus bedrock interaction in the Amery Ice Shelf region and role of heterogeneities of the continental crust in the Amery Ice Shelf region and adjacent areas of the Princess Elizabeth Land (PEL)

The GeoEAS will be executed under the umbrella of the Indian Antarctic Programme. ESSO-NCPOR invites short-term and long-term innovative scientific proposals in thematic areas and its sub-themes in different disciplines as per advertisement.

2. Area of operation

ESSO-NCPOR proposes to set-up a temporary base (summer station) at Lambert Glacier/Amery Ice-shelf. The summer-base will be supported from the voyage vessel off Amery Ice Shelf and Bharati Station. The recce for summer-base at LG/AIS region is underway and will be established in the first phase.

[Considering the distance between two regions- Larsemann Hills and Lambert Glacier; and logistics involved, scientific proposals are expected to be well thought out and viable]

3.0 TRAVEL

The expedition in the LG/AIS is proposed to be launched during the first leg of the Indian Scientific Expedition to Antarctica's (ISEA) voyage journey from Cape Town to Bharati.

3.1 Travel Season for Antarctica: December to February of succeeding Calendar Year.

3.2 Mode of Travel

By sea: Goa to Cape Town (Commercial airlines); Cape Town - Lambert Glacier - Bharati - Lambert Glacier - Maitri (by ship/s on ESSO-NCPORcharter vessel).

[It's important to note that the mode of travel to LG/AIS is only by voyage vessel]

4.0 Infrastructure facility

Living Capacity: Summer– 12

Around 12 Expedition members for short-term can be accommodated in camping tentages/living modules. Members have to carry their items of equipment chemicals/ sample collection, storage & transportation devices. In case of large space requirements for any instrumentation both in terms of logistics and power consumption, the same should be spelt out in detail and also presented and discussed during the presentation at NCPOR.

Inland transport - Helicopters

Ship based helicopters are available for scientists working in the LG/AIS region. The helicopters are available only when the ship is around Amery Ice-shelf. Need based heli support shall be provided. Projects with intensive helicopter requirements should spell out the details in advance.

[In view of the available infrastructure, the proposed scientific work should be confined within the logistic reach, ideally not exceeding 100 km from station in campaign mode]

5.0 Duration of stay in Lambert Glacier/Amery Ice-shelf

The summer-base at Lambert Glacier/Amery Ice-shelf (LG/AIS) will be operational for a very short duration ranging from 4- 6 weeks during summer season between December to February of succeeding calendar year.

Cape Town - LG/AIS: Early January – Induction of scientific personnel and cargo
LG/AIS - Bharati: January to February – Execute scientific and logistic operations
Bharati - LG/AIS: February – De-induction of scientific personnel and cargo

Note: Scientists participating in GeoEAIS will be travelling by expedition vessel only