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**INVITATION FOR INNOVATIVE RESEARCH PROPOSALS FOR THE
44th INDIAN SCIENTIFIC EXPEDITION TO ANTARCTICA (XLIV-ISEA)**

(Last date for ONLINE SUBMISSION – 16 February 2024)

The National Centre for Polar and Ocean Research (NCPOR), under the Ministry of Earth Sciences (MoES), Government of India, is the nodal agency for the implementation of the Indian Antarctic Program. Hitherto, forty-two scientific expeditions to Antarctica have been successfully completed, and the 43rd Indian Scientific Expedition to Antarctica (ISEA) is currently underway. The 44th ISEA (XLIV ISEA) is scheduled to be launched in October-November 2024, and the proceedings are being initiated through this advertisement.

The 44th Indian Scientific Expedition to Antarctica (44-ISEA) embarks on a new journey of scientific research with a focus on “Climate Change and its signatures in Antarctica”. NCPOR welcomes long-term innovative scientific proposals in thematic areas and its sub-themes in different disciplines, which are given below. In addition, scientific projects are also invited under the new research area “Geological Exploration of Amery Ice Shelf (GeoEAIS)”, which was initiated in 41-ISEA. The research focus is in Amery Ice-Shelf/Lambert Glacier off Prydz Bay, which is being developed as a multi-institutional program with special reference to the identification of orogenic and cratonic components to arrive at a refined India-Antarctica geological correlation. More details on GeoEAIS is presented in Annexure I.

For the 44-ISEA, we are inviting scientific programs to be executed at Antarctica for the following themes given below:

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 teleconnections to the Tropics
- d) Paleoclimate (Ice and sedimentary archives)
- e) Surface Processes and Landscapes

II. Crustal evolution

- a) Reconstruction of sub-ice geology
- b) Early Earth and the 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

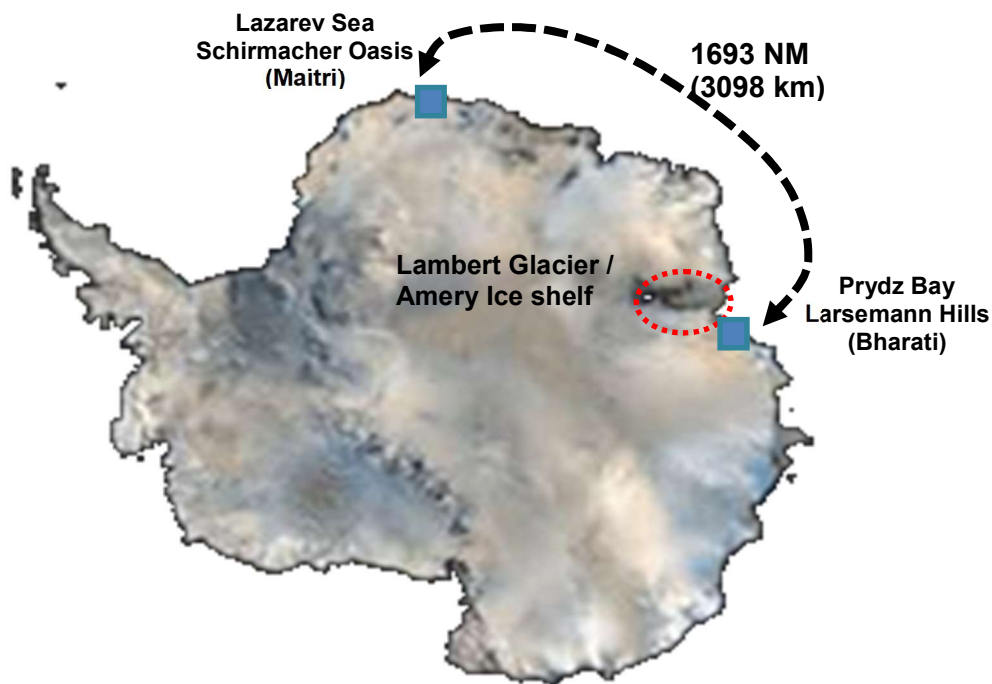
- a) Lake biogeochemistry and productivity
- c) Microbial diversity
- d) Polar biodiversity
- e) Wildlife

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

1. Area of operation

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



- 1.1. **MAITRI** Station ($70^{\circ}45'58''S$; $11^{\circ}43'56''E$) is located in Schirmacher Oasis, Central Dronning Maud Land. It is an inland station nearly 80km from the edge of the Lazarev ice-shelf (Indian Barrier for Ship).

Connectivity: Maitri is connected by intercontinental flight between Cape Town and Novo airfield (near Maitri station: approx. flying time is 6 hrs). Maitri can be reached as early as late October or early November by intercontinental flight. Flight timings and dates can be advanced/postponed subject to weather conditions in Antarctica.

The Voyage Vessel reaches Maitri (India Bay/Lazarev Sea) tentatively during the first week of March.

- 1.2. **BHARATI** Station (69°24.41'S, 76° 11.72' E) is located in North Grovnes Island, in Larsemann Hills along the Ingrid Christensen Coast and off Prydz Bay. It is located off the Quilty Bay (~ 200 m from the coast).

Connectivity: Bharati is connected by intra-continental flights viz., Basler/Twin Otter aircraft (12-seater). Flights operate between Novo Airfield and Zenit Airfield (near Bharati Station). The first flight to Bharati can be expected around mid-November. The flying time between Novo and Progress takes approximately 8-10 hrs, with a mid-way stop for fueling. The seating may vary depending on passengers and cargo. These flights are very expensive and need prior planning for the availability of aircraft and midway refuelling. Currently, there are no direct chartered flights between Cape Town and Bharati. Bharati by air is connected only via Maitri.

The Indian Voyage Vessel reaches off Bharati in the first/second week of January.

Note: Access to Lambert Glacier/Amery Ice Shelf region will be from Bharati Station, Larsemann Hills or off Amery Ice Shelf via Voyage Vessel, depending on weather conditions, helicopter availability and project objectives.

- 1.3. **SHIPBOARD OPERATIONS** can be proposed during the course of the voyage. The general Voyage route is Cape Town-Bharati-Maitri-Cape Town. The route may change based on the expedition objective.

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

Leg II: Bharati to Maitri –The voyage time 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.

Scientific operations which can be done without stopping the ship can be carried out en route voyage. The ship is a chartered cargo vessel (not a research vessel) and 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 the project proposal/s.

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

2.0 TRAVEL

2.1 Travel Season for Antarctica

- 2.1.1 Air operations between Cape Town and Maitri (inter-continental), and between Maitri and Bharati (intra-continental) are possible only in the summer season, i.e. between November and February. The flight schedule is highly dependent on weather conditions and charted in discussion with other National Antarctic Programmes operating in the Central Dronning Maud Land (cDML) under the aegis of COMNAP.

- 2.1.2 Ship operation between Cape Town and Bharati/ Maitri, depending on the voyage plan for the season, is possible from December to April of the succeeding calendar

year. The Voyage Vessel exits from Lazarev Sea (India Bay) in the last week of March.

[The last flight usually is scheduled during mid-February. The ship exits Lazarev Sea (India Bay) usually during late March. Antarctica becomes inaccessible once the ship exits from India Bay as winter sets in.]

2.2 Mode of Travel

2.2.1 **By air:** Goa to Cape Town and back (Commercial airlines: Managed by NCPOR); 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 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 the project. Travel arrangements for all expedition members from Goa to Antarctica and back are managed by NCPOR]

3.0 Stay in Antarctica

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 and March of the succeeding calendar year.

Scientists participating in the 44-ISEA, desirous of working only through the summer season, can embark on Antarctica in October-November 2024 and return by February-April 2025, and those proposing for the winter season will continue their stay in Antarctica only to return between December' 2025 to March' 2026

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 to 60

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/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, subject to weather and operational situations. Projects with intensive helicopter requirements should present and discuss the details during the workshop.

4.1.4.2 Snow Vehicles

Snow vehicles (Pisten Bully, Snow scooters) are available round the year. However, requirement details should be presented and discussed during the workshop.

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

4.2 **Bharati**

4.2.1 Living Capacity Summer 47 & Winter 22

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 near Bharati. Ship-based helicopter/s are available for scientists working in field, subject to weather and operational conditions. Projects with intensive helicopter requirements should present and discuss the details during the workshop.

4.2.3.2 Snow Vehicles

Snow vehicles (Pisten Bully & snow scooters) are available round the year. However, requirement details should present and discuss the details during the workshop.

[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 **Communication facility available with the stations**

Internet connectivity and e-mail facilities are available at both stations. Currently, both stations Maitri and Bharati is supported by high-speed internet.

NCPOR provides limited time for calling from the station and the ship. The 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 and at both stations for communication.

5.0 Eligibility for participation in the 44th ISEA Expedition

For participating in the 44-ISEA, the proposer of the scientific project i.e. the Principal Investigator (PI) - should be a regular employee with expertise in the relevant field.

The participant/s indicated in the scientific proposal for participation in the 44-ISEA should mostly be affiliated with the Principal Investigator's organization/institute/university. In case of collaboration with other institutes/university/organization, same should be explicitly mentioned and supplemented with relevant documents. NCPOR encourages scientific collaboration with other organizations/institutes/universities.

The proposals for the 44-ISEA should be submitted to 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 proposal has to be submitted through the online submission portal only which, can be accessed here (<http://isea.ncpor.res.in/>). The last date for submission of online proposal is 16-February-2024.

Proposals are invited for both short-term (summer) and long-term (winter) for Bharati (Larsemann Hills), Amery Ice Shelf/Lambert Glacier, Maitri (Schirmacher Oasis) and Voyage Route.

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

6.0 Process of selection

After due submission, the proposal will be reviewed by Subject Experts for preliminary screening. The PI should respond/attend to review comments received by them. Upon recommendation by the subject expert and satisfactorily attending to their query/comments, the PI will be invited to defend their research proposal at a workshop headed by a panel of experts. The workshop is tentatively scheduled for 17-18 April, 2024 [dates may be subjected to change] at NCPOR. All proposals should be scientifically and logistically viable.

PI/Co-PI should invariably defend the proposal at NCPOR during the workshop in person and at their own expense. Request for online defense is not accepted.

6.1 All organizations to provide full personal details of participating individual including the stand by members by **30 April 2024** on the prescribed form numbered AL-1208(<http://isea.ncpor.res.in/>). Please send your nominations and completed AL-1208 forms to antarctic-sci@ncpor.res.in or antarcticsscience22@gmail.com.

The nominated team members/participants for the expedition will have to undergo -

6.2 A detailed Medical Examination at the All India Institute of Medical Sciences (AIIMS) New Delhi. **Participants should arrange for their own travel and stay at their own expense.** This is immediately followed by Snow acclimatization training at the Mountaineering & Skiing Institute (ITBP), Auli, Uttarakhand. The expenses from MoES, New Delhi, to Auli and back to MoES, New Delhi, will be managed by NCPOR. Medically and physically fit members will receive an intimation about their status in due time.

6.3 Members from Government institutes are encouraged to apply for the Official Passport through their parent organization with the last date for submission of Official Passport to NCPOR on 01 September 2024.

Note: For short-term participation, the passport should be valid until 30 September 2025, and for long-term participation, the validity should be 30 September 2026.

7.0 Team movement for Antarctica

Team Movement 44-ISEA (2024-25)

Air Travel to Maitri/ Bharati tentative schedule for season 2024-25

Departure from Goa	Oct-24 to Dec-24
Departure from Cape Town	Nov-24 to Dec-24
Arrival Maitri/Bharati	Nov-24 to Dec-24
Departure Maitri/Bharati	Dec-24 to Feb-25
Arrival Cape Town	Dec-25 to Mar-25
Arrival Mumbai/Delhi	Dec-25 to Mar-25

Expedition members shall be inducted and de-inducted from Antarctica in batches, depending on the availability of ship/flights and project requirements.

8.0 Scientific Cargo Movement:

The expedition's scientific cargo is sent from Goa to Cape Town through commercial freight carriers/shipping lines. It takes nearly 45-60 days for the cargo to reach Cape Town, excluding the lead time for customs formalities. For onward carriage to Larsemann Hills, Antarctica, the cargo will be shipped onboard the chartered expedition vessel.

Please note the below points for the smooth transfer of cargo to Antarctica:

- a) Air Cargo: **From Goa – Cape Town – Maitri. Pls can directly send their scientific cargo to Cape Town at the earliest through their institutes.** This will enable them to save time and deliver their cargo at the earliest at our logistic hub viz., Cape Town, South Africa. From here, cargo will be delivered to the respective stations based on the time of induction of the PI into Antarctica.
- b) There is a limitation for the transfer of cargo by air via intra-continental flights between Maitri and Bharati. The maximum weight these small flights can carry is between 1500 – 1800 kgs (weather dependent) which is inclusive of personnel, personnel cargo, scientific cargo, and emergency kits. Heavy cargo cannot be carried in these flights and best avoided.
- c) Following Point (c) If a PI intends to reach Bharati or Maitri in early November, then they need to plan their scientific objectives and expedition accordingly. Heavy cargo can be delivered **only by ship/voyage vessel**. In case the project has tons of cargo, PIs can plan to deliver the cargo to the respective station during the preceding expedition and work in the following expedition.

- d) PI's/Organizations should make sure that the scientific cargo must reach NCPOR, Goa on or **before 31-July-2024 (for air cargo from CapeTown to Maitri/Bharati)** and **31-August-2024** (for voyage) else it could be left out and thus jeopardising their program.
- e) Package dimensions for cargo transfer by air: The size and weight of individual packaging/box/baggage should not exceed 90x72x45 cm (LHW) and 30 kg in weight.
- f) Packaging shall be proper and airworthy, preferably in steel/aluminium boxes and the dimensions of the individual units preferably not more than 30kg in weight unless it's for some special scientific instrument. Scientific instruments in carton boxes are discouraged however, consumables/lab ware/glassware etc., may be sent in factory packing. The packing should be tamper proof and 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 and renders the cargo heavier. 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 the expedition number, e.g. 44 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 out rightly rejected.

- g) 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.

9.0 Allowances for travel and stay in Antarctica

9.1 NCPOR manages 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. Currently, a participant is entitled to a contingency amount of Rs.40,000 (summer member) and Rs. 60,000 (winter member) to purchase polar clothing, cosmetics, etc.

9.2 All other expenses, including those related to procurement of scientific equipment, attending pre-Antarctic training, arrival to Goa, Hard Duty Allowance etc., will have to be borne by the participating organization. The following 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 NCPOR' terms and conditions]. Short-term / Summer season (1st December to 28th/29th February) and Long-term / Winter season (1st March to 30th November).

10.0 Conduct of Members

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

should adhere to “THE SEXUAL HARASSMENT OF WOMEN AT WORKPLACE (PREVENTION, PROHIBITION AND REDRESSAL) ACT, 2013”, “THE INDIAN ANTARCTIC ACT, 2022”, Indian Antarctic Environmental Rules 2023.

11.0 Nominations/Applications for Leader for 43-ISEA [Maitri, Bharati and Voyage]

NCPOR welcomes nominations from organizations for selection of the Leader for Maitri or Bharati or Voyage.

Candidates having leadership qualities with Antarctic experience are preferred.

Letter of nomination addressed along with bio-data and professional experience of the nominated candidate should be sent separately on antarctic-sci@ncpor.res.in with a copy to: antarcticsscience22@gmail.com “Proposed Leader 44-ISEA- MAITRI / BHARATI & VOYAGE” (preference to be clearly indicated) by the Head of the organization.

12.0 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 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 Indian Scientific Expedition comes under the aegis of the Indian Antarctic Program. The full set of metadata that completely documents and describe the data is to be submitted to 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 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).

13.0 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 that needs to be adhered to in word and spirit (Details can be obtained from https://www.ats.aq/index_e.html). Defacing Antarctica temporarily or permanently is strictly prohibited. Legal action will be enforced on defaulters.

14.0 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://isea.ncpor.res.in/>.

15.0 Submission of Proposal Online

The online submission of proposals will be closed on **16 February 2024** at 1730 hrs. Please make sure you submit your proposals with all relevant documents. Kindly note that the Submission of the Proposal, Review of the Proposal and Evaluation are now carried out online and hence, submit all necessary documents online or directly visit <http://isea.ncpor.res.in/>.

- a) If there is any other participating organization involved in the proposal, an endorsement from their institute as well as for collaborations sought should be part of the proposal and be explicit.
- b) Any person who is willing to visit Antarctica under the umbrella of the Indian Antarctic Program for scientific and logistics operations of the Indian Antarctic expedition (except those persons who are not an Indian citizen and obtained authorization/Permit from another Party to the Protocol but are part of India Antarctic Expedition) needs to submit the applications (Form 1 to Form 3, as applicable):
 - I) for Indian Expedition to Antarctica/ To Enter /To Stay at Indian Station/s (Form 1)
 - II) for Entering and Performing Activities in Antarctic Specially Protected Area/ Marine Protected Area (Form 1A)
 - III) for Mineral Resource Activity including collection of sediments, soil, rocks etc. (Form 1B)
 - IV) for activities i.e (Form 1C):
 - Removal or Damage to Native Plants/ Birds/Mammals
 - Disturb the Habitat of Native Birds
 - Remove Soil or Biological Material
 - Collection/Removal of any Other Sample for the Purposes of Scientific Research
 - V) for Vessel/Aircraft Entering Into Antarctic/ Convention Area (Form 2)

- c) **Post Activity Report**
 Once the Permit is issued by Committee on Antarctic Governance and Environmental Protection (CAG-EP) to the proponent, he/she should abide by all the conditions mentioned in the Permit, issued to perform, specified activity/ies. After completing the activity, the proponent has to submit the Post activity report (R1 to R3 as applicable), within three months of completion of the activity in Antarctica. These Post activity report forms are:
- I) On Permit issued for entry, carrying out activities and stay in Antarctica (Form R1)
 - II) On Permit issued to enter Antarctic Specially Protected Area/ Marine Protected Area/Historic Site and Monuments (Form R2)
 - III) On Permit issued for Fishing/Tourism/Recreational Activity in Antarctica
 - IV) (Ship/Vessel based activity) ((Form R3)
- d) PI's should strictly follow online submission. There is no option of submitting proposals via email.

More details are available on our webpage <https://ncpor.res.in/> and <http://isea.ncpor.res.in/>.

16.0 Important Deadlines

16 February 2024	The last date for receipt of the online application
31 March 2024	Communication from NCPOR conveying the status of the initial screening of the proposal
17 & 18 April 2024	Workshop for evaluation of projects at NCPOR
30 April 2024	Last date for receiving personal details of expedition members (use AL-1208 form) and permit application Form for CAG-EP (Duly endorsed hardcopy)
15 May 2024	Last date for receipt of Nomination for Leader(s)
31 July 2024	The last date for receipt of scientific cargo is immediately required during the expedition at Maitri/Bharati. This cargo will be sent via freight lines (Goa-Cape town) and air lifted from Cape town to Maitri/Bharati.
01 October 2024	Last date for receipt of Personal Passport
15 July to 05 Oct 2024	Tentative period for Medical & Auli Training
31 August 2024	The last date for receipt of scientific cargo required during the voyage or later for the summer/winter period. This cargo will be sent via shipping lines
November 2024	Induction into Antarctica in batches
For any queries, kindly write to antarctic-sci@ncpor.res.in and antarcticsscience22@gmail.com	

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

The Amery Ice Shelf (69°45'S71°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.

NCPOR have initiated a 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 carryout research activities in the LG/AIS.

A multinational geoscientific program named as Geological Exploration in and around Amery Ice-Shelf (GeoE AIS) 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 (EAIS) 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 GeoE AIS will be executed under the umbrella of the Indian Antarctic Programme. 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

NCPOR during the 41-ISEA has 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. This new summer base is named as "Sandhi".

[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 NCPOR charter vessel).

(Mode of travel: through air/ship beginning Nov/Dec)

[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 GeoE AIS will be travelling by expedition vessel only