

INDIA'S FIRST-EVER POLAR RESEARCH VEHICLE – SCIENCE & TECHNOLOGY

NEWS: Recently, Garden Reach Shipbuilders and Engineers Limited (GRSE), a Government of India undertaking, signed an MoU with Norwegian firm Kongsberg to co-design and build India's first-ever polar research vehicle (PRV) indigenously.

WHAT'S IN THE NEWS?

Polar Research Vehicle (PRV)

- A **Polar Research Vehicle (PRV)** is a specially designed **ship** that acts as a mobile platform to facilitate **scientific research in polar regions** – the Arctic and Antarctic.
- Apart from polar studies, the PRV is also capable of **undertaking oceanographic research**, supporting India's expanding interest in marine ecosystems and ocean sciences.



India's Polar Research Legacy

- **Dakshin Gangotri** was India's **first permanent Antarctic research station**, established in **1983**, following India's initial Antarctic expedition in 1981.
- Though **Dakshin Gangotri is now buried under ice**, it paved the way for two active Indian stations:
 - **Maitri**, established in 1989.
 - **Bharati**, operational since 2012.
- India also maintains the **Himadri station in the Arctic**, located in **Ny-Ålesund, Svalbard (Norway)**.

Governance under the Antarctic Treaty

- India became a party to the **Antarctic Treaty in 1983** and holds **Consultative Party status**, allowing it to participate in decision-making and governance of activities in Antarctica.
- The treaty governs all activities in Antarctica and promotes **peaceful use, scientific cooperation, and environmental protection**.

Features of India's PRV

- The PRV will be equipped with **cutting-edge scientific instruments** to:
 - Study **polar climates** and **deep-sea ecosystems**.
 - Support research in **marine biodiversity, climate change, glaciology, and geological surveys**.
- The PRV will be constructed with **ice-breaking capabilities**, allowing it to operate in extreme polar conditions.

Nodal Agency – National Centre for Polar and Ocean Research (NCPOR)

- The **NCPOR**, under the **Ministry of Earth Sciences**, is India's key institution for:
 - Planning and executing expeditions to the **Arctic, Antarctic, and Himalayas**.
 - Overseeing India's polar research infrastructure and scientific output.
- The PRV will be specifically tailored to meet NCPOR's scientific and logistic requirements.

Strategic and Technological Significance

- The PRV will provide **logistical support** to all **three of India's polar research stations**:
 - **Bharati** and **Maitri** in Antarctica.
 - **Himadri** in the Arctic.
- It will **strengthen India's polar presence**, boost **scientific diplomacy**, and enable year-round research.
- The construction of the PRV by **Garden Reach Shipbuilders & Engineers (GRSE)** in **Kolkata** will enhance **India's indigenous shipbuilding capacity**, contributing to the **Make in India** initiative.

Global Polar Research Vessels – Comparative Insights

- **Norway – RV Kronprins Haakon (2018):**
 - Can **break ice up to 1 metre thick**.
 - Equipped with **advanced robotics, sensors, and modular laboratories**.
- **Russia – Akademik Tryoshnikov (2012):**
 - Designed for **extended Arctic expeditions**.
 - Specializes in **hydroacoustic and oceanographic studies**.
- **USA – RV Sikuliaq (2014):**
 - Can break **0.76-metre-thick ice**.
 - Designed for **multidisciplinary, real-time research** across oceanographic fields.
- **China – Xue Long 2 (2019):**
 - A **bi-directional icebreaker** capable of cutting through **1.5 metres of ice**.

- Serves both **scientific research and logistics support** in Antarctica and Arctic regions.

India's Maritime Strategic Initiatives

- **SAGAR (Security and Growth for All in the Region):**
 - Announced in 2015, it focuses on **maritime cooperation** in the Indian Ocean Region.
 - Emphasizes **regional security, disaster response, environmental protection, and economic collaboration.**
- **MAHASAGAR:**
 - Launched as an **expanded version of SAGAR** to facilitate **deeper integration** with countries in the **Indo-Pacific and beyond.**
 - Supports **capacity building, training, and joint exercises** in maritime sectors.
- **Sagarmala 2.0:**
 - An upgraded initiative aimed at:
 - **Bridging infrastructure gaps** in ports and logistics.
 - Promoting **domestic shipbuilding, repair, and recycling industries.**
 - Positioning India as a **global maritime leader** through modernization and sustainability.

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