NEXT CHALLENGE

— Japan's first Arctic research icebreaker —

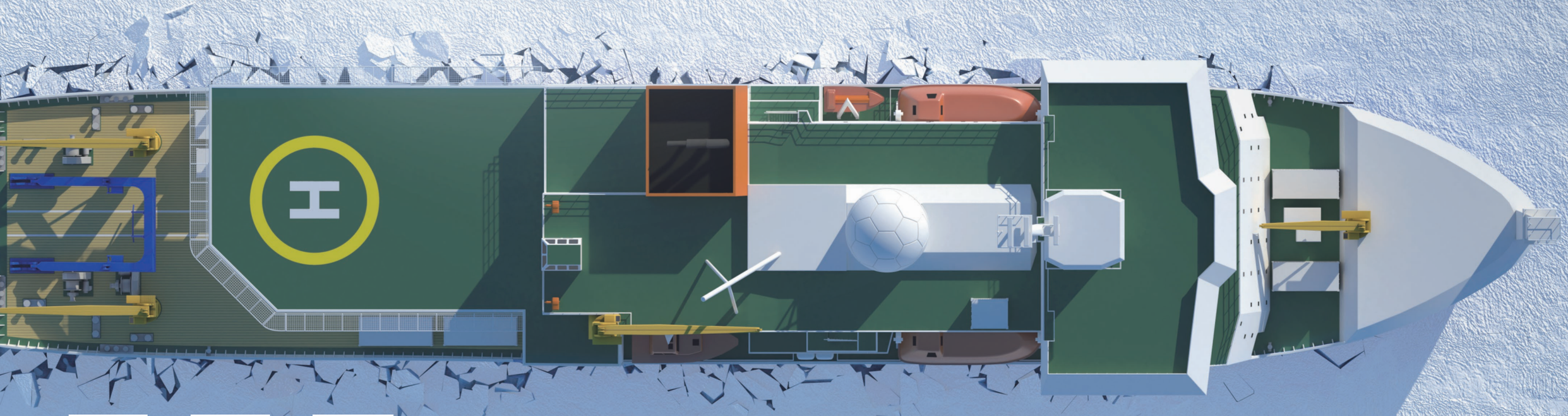
○ Major Features

- High-precision and multi-parameter observation equipment for atmospheric, oceanic, meteorological, and biological research
- Fuel-efficient hull shape for ice-breaking, ice-resistant performance, and navigation in ice-free areas
- Equipped with an advanced ice-sea navigation support system
- Dual-fuel engine to reduce environmental impact
- Dynamic positioning system
- Facilities for deployment and operation of Unmanned Underwater Vehicles (ROV, AUV, etc.)
- Helicopter facilities for safety and sea ice observation
- Ideal research and analysis environment with a variety of laboratory spaces and excellent network infrastructure
- Living & working environment for multinational teams
- Potential for multi-use and expandable functions (e.g. operation and assistance in natural disaster-affected areas)

○ Main specifications (planned)

Length	128m
Beam	23m
Depth	12.4m
Draft	8m
Gross tonnage	13,000 tons
Ice-breaking capacity	capable of continuously breaking 1.2 m of flat, one-year ice at a speed of 3.0 knots
Ice Class	Polar class PC*4
Generator Diesel	approx. 5,200kW x 3, Dual fuel diesel (DFD) approx. 2,400kW x 1
Propulsion	Variable pitch propeller
Accommodation	99 (34 crew, 65 scientists/engineers)
Completion (planned)	FY2026

＊The International Association of Classification Societies (IACS) has established uniform rules for certifying a ship's ability to withstand ice in ice-covered sea areas. Polar Class 4 is defined as "capable of navigating year-round operation in thick first-year ice, which may include old ice inclusions."



WEB

The intro movie

YouTube channel

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https://www.jamstec.go.jp/e/

Japan's first Arctic research icebreaker

The Arctic faces many difficult challenges, including environmental changes that have led to the loss of sea ice; we need to learn how to manage the increased economic activities resulting from these changes. These environmental changes are causing far-reaching effects, some of which are seen as extreme weather systems outside of the Arctic region, e.g. extreme snowfall occurring in Japan. As such, the changing Arctic environment is really a global concern.

Japan, as a nation affected by these changes, and as a world leader in scientific research, has a responsibility to form a commitment to scientific investigations into the changing environment of the Arctic.

Japan is building an Arctic research vessel with icebreaking capabilities and world-class scientific facilities to fulfill these commitments. This research vessel will promote the importance of Arctic science and work towards sustainable development of the Arctic region.

Furthermore, Japan remains committed to developing the next generation of scientists and engineers to utilize this research vessel and plans to develop further and deeper collaborations with our international partners.

① Weather balloon carrying atmospheric instruments

Measure atmospheric variables such as air pressure, temperature, and humidity.

③ Rainfall/snowfall observations using a meteorological radar system

Measure weather variables over the Arctic Ocean such as the wind speed, speed and size of raindrops and snowflakes inside clouds by doppler radar.

⑤ Sea-ice observation via autonomous on-ice and under-ice vehicles

Non-destructive observation above and below the sea ice to:
- Measure ice thickness and floe shape, and
- Observe the marine environment under the ice.

② Helicopter operations

Helicopters have become “standard equipment” for observations, research, and safety operations in the distant Arctic.

④ Hull and superstructure monitoring of the ship

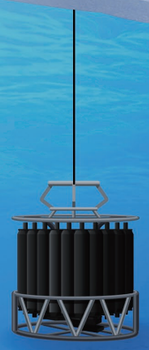
Collect data on the ships’ ice load continued safe operations and maintenance.

⑥ Piston corer

Collect seafloor sediment cores without disrupting the sediment layers.

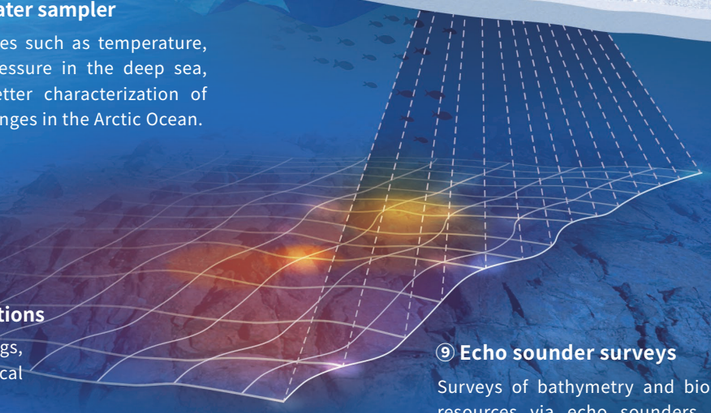
⑦ Moorings, for fixed-point observations

Maintain JAMSTEC’s instrumented moorings, which monitor physical and biological changes in the Arctic Ocean.



⑧ Deep sea water sampler

Measure variables such as temperature, salinity, and pressure in the deep sea, which allow better characterization of the ongoing changes in the Arctic Ocean.



⑨ Echo sounder surveys

Surveys of bathymetry and biological resources via echo sounders in the Arctic Ocean.

⑩ Seafloor surveys via ROV/AUV

Underwater data and sample collection via autonomous underwater vehicles.

※This schematic illustration introduces the observation function. It may differ from actual conditions and operations.