

# TECHNICAL CHARACTERISTICS

AURORA BOREALIS is technically unique. It is designed as a combination of a heavy icebreaker, a deep-sea drilling ship and a multi-purpose research vessel. The operational portfolio comprises the polar regions during all seasons of the year as well as the open oceans. To date, no comparable vessel for year-round polar expeditions is available worldwide, neither in commercial shipping and the offshore industry, nor for scientific operations. The naval architects and engineers thus succeeded in developing the world's most advanced icebreaker with the ability to perform scientific deep-sea drilling even within closed sea-ice cover.



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## TECHNICAL DETAILS COMPACT

- Diesel-electric icebreaker with 81 MW propulsion power
- Highest attainable shipping classification for icebreakers
- Complete twin hull design and full redundancy in ship's safety systems
- Two moon pools 7 x 7 m each, one for deep-sea drilling, one for deploying other scientific equipment (ROV, AUV, observatories, etc.)
- Dynamic Positioning System within closed sea-ice cover and open water
- Advanced ice-forecasting and management with autonomous, multiple helicopter support
- Deep-sea drilling in closed sea-ice cover with more than 2 m thickness
- Rig specification: drilling in more than 5,000 m water depth with 1,000 m penetration
- Riserless drilling technology
- Modularized mobile laboratory systems - mission specific laboratories

Length over all: 199.85 m  
Moulded breadth: 49.00 m  
Maximum draught: 13 m  
Max. speed in open water: 15.5 kn  
Cruising speed in open water: 12 kn

Personnel (crew, scientists and helicopter crew): 120  
Max. operational endurance: 90 days



The AURORA BOREALIS project is supported by:

**ICEBREAKER,  
DRILLING PLATFORM  
AND  
MULTI-PURPOSE  
RESEARCH VESSEL**

[WWW.ERI-AURORA-BOREALIS.EU](http://WWW.ERI-AURORA-BOREALIS.EU)

KLEMM BRENDENDE



## THE PROJECT

The European Research Icebreaker Consortium – Aurora Borealis (ERICON-AB) is financed by the European Commission under the 7th Framework Program (FP7) and managed by the European Science Foundation and the Alfred Wegener Institute. It runs from 2008-2012 and prepares the strategic, scientific, legal, financial and governance frameworks for the vessel. The construction phase starts there after.

AURORA BOREALIS is included in the priority list of the European Commission's "European Strategy Forum on Research Infrastructures" (ESFRI) within the FP7 and is specifically mentioned in the European Commission's published Arctic Communication. Participating countries in this preparatory project are currently Belgium, Bulgaria, Denmark, Finland, France, Germany, Italy, The Netherlands, Norway, Russia and Romania.

The AURORA BOREALIS project focuses on two scientific communities: **The first** one is the general polar science community, which requires a research vessel for conducting **year-round** research, observations and experiments in the central Arctic Ocean. Weather and ice conditions prevent the autonomous penetration of research vessels into this pack ice-covered realm during bad seasons when the most critical climatic, biological and oceanographic processes occur. AURORA BOREALIS with its maximum ice-breaking capability, dynamic positioning in closed sea-ice cover, advanced ice-forecasting and management with autonomous, multiple helicopter support, the possibility of deployment and operation of Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs) for sub-ice surveys from the twin moon-pools and the modularized missionspecific laboratory systems will be the premiere platform to accomplish such programs and yield new scientific results.

**The second** is the deep-sea drilling science community such as the Integrated Ocean Drilling Program (IODP), which would use the ship mainly during summer months with optimal ice condition to study the structure and properties of oceanic crust and the history of the oceanic depositional environments.



In spite of the critical role of the Arctic Ocean in climate evolution, it is the only basin of the world's oceans that has essentially not been sampled by the drill ships of the Deep-Sea Drilling Project (DSDP) or the Ocean Drilling Program (ODP) and its long-term environmental history and tectonic structure is therefore poorly known. This lack of data represents one of the largest gaps of information in modern Earth Sciences. Therefore, the new research icebreaker AURORA BOREALIS shall be equipped with drilling facilities to drill in deep, permanently ice-covered ocean basins.



In a long-term perspective the AURORA BOREALIS will be used to address research targets in the Arctic and around Antarctica, both in its mode as a regular multi-purpose research vessel as well as a polar drill ship.

The ERICON-AB project is supported by the European Commission under Framework Programme 7 (Contract ERAC 211796).



## SCIENTIFIC RELEVANCE

Polar research and in particular the properties of northern and southern high latitude oceans are currently a subject of intense scientific debate and investigations, because they are (in real time) and have been (over historic and geologic time scales) subject to rapid and dramatic climatic variations. Polar regions react more rapidly and intensively to global change than other regions of the earth. Europe has a particular interest in understanding the Arctic environment and its potential for change because many of its highly industrialized nations reach into high northern latitudes and because Europe is under the steady influence of, and in exchange with, the Arctic environment. In addition, considerable living and non-living resources are found in the Arctic Ocean.

Research in the polar regions can only be carried out by sophisticated research vessels. Modern research vessels that are capable of penetrating into the central Arctic are rare. A new state of the art research icebreaker is therefore urgently required to fulfill the needs of European polar research.

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