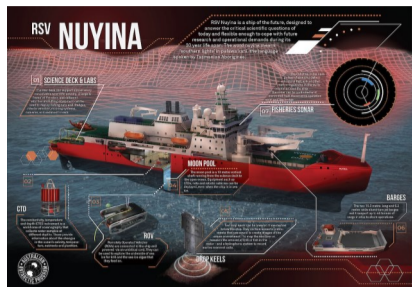




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Awesome poster of new icebreaker:
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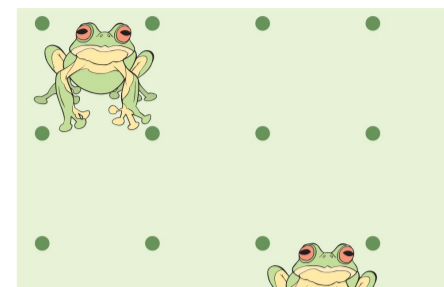


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Two-player box the frog game:
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NEW ICE AGE

AUSTRALIA's new icebreaker, the RSV *Nuyina*, is expected to be delivered to its owners, the Australian Antarctic Division (AAD), in Hobart in mid-2021.

It will be an exciting day for scientists, because the ship has been designed to provide for the needs of AAD and Antarctic and Southern Ocean research for the next 30 years.

You might have seen or even visited another large orange ship, the RSV *Aurora Australis*.

The *Aurora Australis* was retired from Australia's Antarctic program in March, after 31 years of service.

A double-sided poster displaying the

Nuyina's amazing design and technology is included with today's edition of *The Wonder Weekly*.

You will see why the *Nuyina* has been described as three ships in one - a world-class scientific research platform, an icebreaker and a resupply vessel.

Your challenge is to produce a fact sheet about the new icebreaker.

Make a list of all the things you find interesting about the ship, and present your findings in a creative way.

Children's University Tasmania members can earn stamps in their passports for this challenge at the discretion of their school coordinators.



NEARLY READY: The RSV *Nuyina* arrives in the Netherlands, where it is undergoing the final stages of testing and commissioning. Picture: © Damen.

Next Antarctic ship to continue a fine tradition

'nuyina' is the *palawa kani* word for the atmospheric phenomenon formed over Antarctica that lights up Tasmanian skies.

You might know this phenomenon as the southern lights or the aurora australis.

This spectacular atmospheric lightshow occurs when electrically-charged solar particles and atoms in the Earth's atmosphere collide with gases like oxygen and nitrogen,

which causes these gases to emit light.

nuyina is pronounced noy-yeenah.

You can listen to an audio recording of the pronunciation here: www.antarctica.gov.au/antarctic-operations/travel-and-logistics/ships/icebreaker/naming-australias-icebreaker/

The new icebreaker's predecessor was the *Aurora Australis*, while the first

Australian Antarctic ship, Sir Douglas Mawson's SY *Aurora* was named after the same phenomenon.

The RSV *Nuyina*, continues this tradition and was named by Australian school children through the AAD's Name Our Icebreaker competition.

SY *Aurora* was a steam yacht built in Scotland in 1876, for use as a whaling vessel in the Northern Hemisphere.

The ship had a solid wood bow which was reinforced with steel-plate armour, to withstand heavy seas and ice.

It was purchased for Australian Antarctic expeditions in 1910, and made five trips to Antarctica between 1911 and 1917.

The SY *Aurora's* involvement in the amazing history of Antarctic exploration includes emergency rescues of stranded expeditioners and the ship being

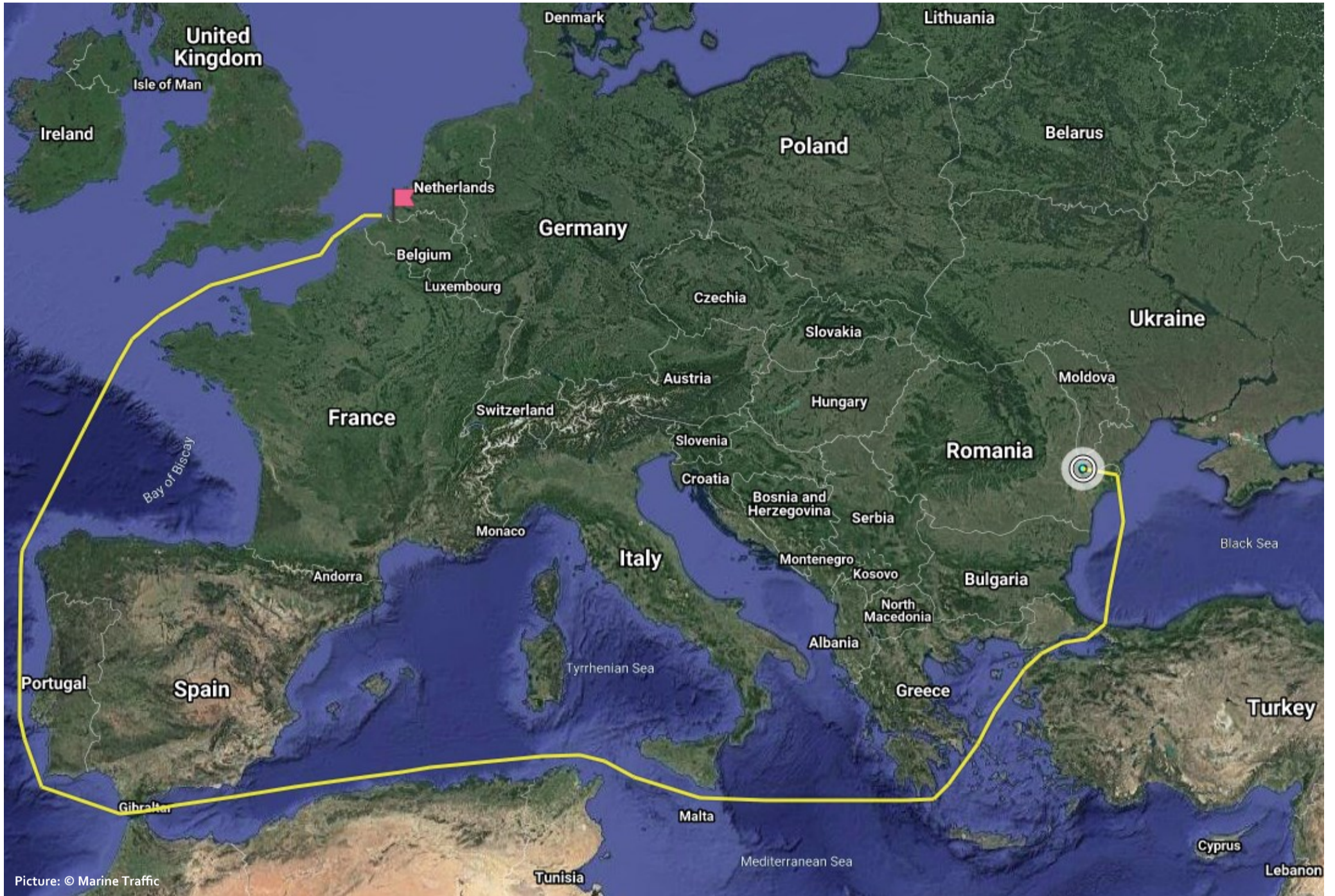
trapped in sea ice for close to a year.

The *Aurora Australis* is an Australian-designed and built icebreaker and was launched in 1989.

After 31-years of service to the Antarctic program, the *Aurora Australis* also has a proud and interesting history.

These are stories which may be revisited in a future edition of *The Wonder Weekly*.

"Education perhaps more than anything else is a passport to a better life." - Peter Underwood AC



Our ship's journey to Hobart

THE RSV *Nuyina* has been an international effort.

Guided by AAD's Icebreaker Project Team, many people around the world have been involved in the ship's design.

It is being constructed by Dutch company Damen, and much of this work has been completed at shipyards in Romania.

The ship recently arrived in the Netherlands for the final stages of its testing and commissioning.

It was towed 6,800km through the Black Sea, the Mediterranean Sea and the Strait of Gibraltar (the map above shows how far it has travelled already).

The 160.3m icebreaker, has a top speed of 16 knots in open water, and can maintain a speed of 3 knots while breaking through ice 1.65m thick.

It can accommodate 117 people, and transport 1200 tonnes of solid cargo and

1,900,000 litres of bulk liquid cargo.

It can handle waves over 14m, and hurricane-strength winds.

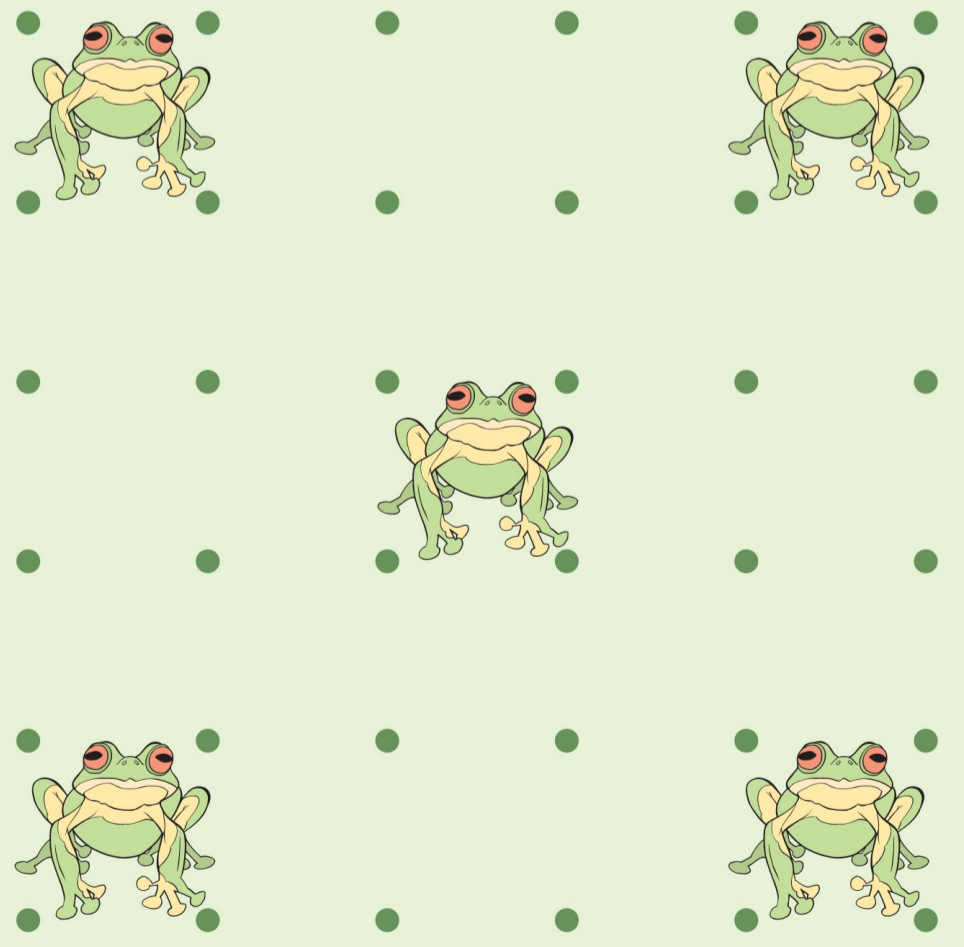
The ship's other features include:

- A moon pool to deploy autonomous vehicles and oceanographic equipment.
- A retractable boom for instruments to measure snow and ice thickness.
- A multi-beam echosounder to map the seafloor.
- A wet well to process seawater containing krill.
- Cranes, support craft and helicopters.

AAD has chartered an interim vessel, the MPV *Everest*, to resupply Australia's three Antarctic stations and Macquarie Island this summer.

Box the FROG

A game for two players. You will need a different coloured pen or pencil each. The aim of the game is to make squares while trying to stop your opponent from doing the same. Starting wherever you like take it in turns to draw a line between two dots. Each time one of you draws a line that completes a square write the first letter of your name in it (these are worth one point each) and have another go. A box around a red-eyed tree-frog is worth five points. The player with the most points at the end of the game wins . . . Good luck!



Artwork: www.johnpollyfarmer.com.au/



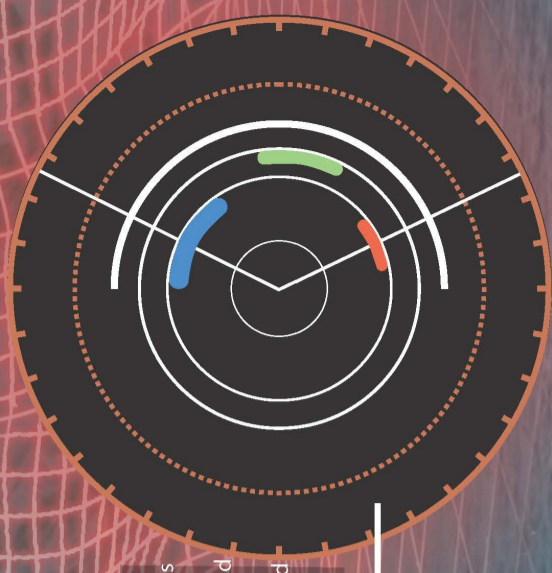
DID YOU KNOW?

Red-eyed tree frogs live in the tropical rainforests of lowland Central America and northern South America. At night they hunt for insects.



RSV NUYINA

RSV Nuyina is a ship of the future, designed to answer the critical scientific questions of today and flexible enough to cope with future research and operational demands during its 30 year life span. The word nuyina means 'southern lights' in palawa kani, the language spoken by Tasmanian-Aborigines.



01 SCIENCE DECK & LABS

The rear deck can support almost every conceivable scientific activity. A large 'A' frame at the stern and different winches and lifting equipment can be used to deploy fishing nets and dredges, robotic vehicles, mooring systems, cameras, and sediment cores.

The fisheries sonar uses pulses of sound to detect schools of fish, krill or other marine organisms in the water column around the ship.

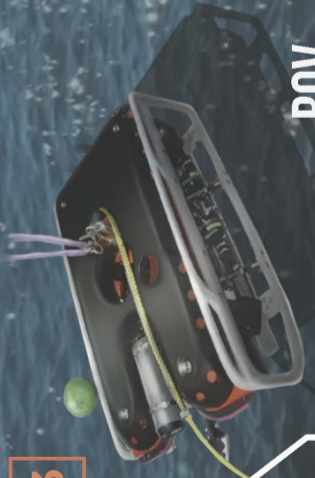
The sonar can be controlled and monitored from the science operation room and the bridge.

07 FISHERIES SONAR

MOON POOL

The moon pool is a 13 metre vertical shaft running from the science deck to the open ocean. Equipment such as CTDs, nets and robotic vehicles can be deployed, even when the ship is in sea ice.

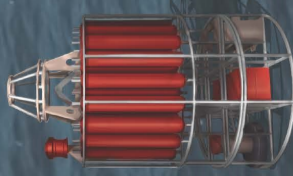
03



ROV

Remotely Operated Vehicles (ROVs) are connected to the ship and powered via an umbilical cord. They can be used to explore the underside of sea ice for krill and the sea ice algae that they feed on.

02



CTD

The conductivity, temperature and depth (CTD) instrument is a workhorse of oceanography that collects water samples at different depths. These provide information about the changes in the ocean's salinity, temperature, nutrients and plankton.

05



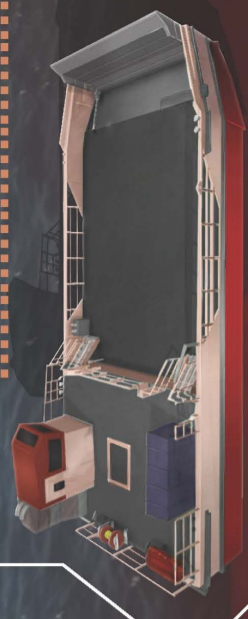
Two drop keels can be lowered three metres below the ship. They contain acoustic instruments that use sound to create images of the ocean environment - to map the sea floor or measure the amount of krill or fish in the water - and a hydrophone system to record marine mammal calls.

DROP KEELS

BARGES

The two 16.3 metre-long and 6.2 metre-wide aluminium jet barges will transport up to 45 tonnes of cargo in ship to shore operations.

06



RSV NUYINA

The ship can carry 1,200 tonnes of cargo in up to 96 20-foot shipping containers. One of the two cargo holds can accommodate vehicles including tractors, LARCs (amphibious vehicles), rough terrain vehicles and Quadtracs.

CARGO 08

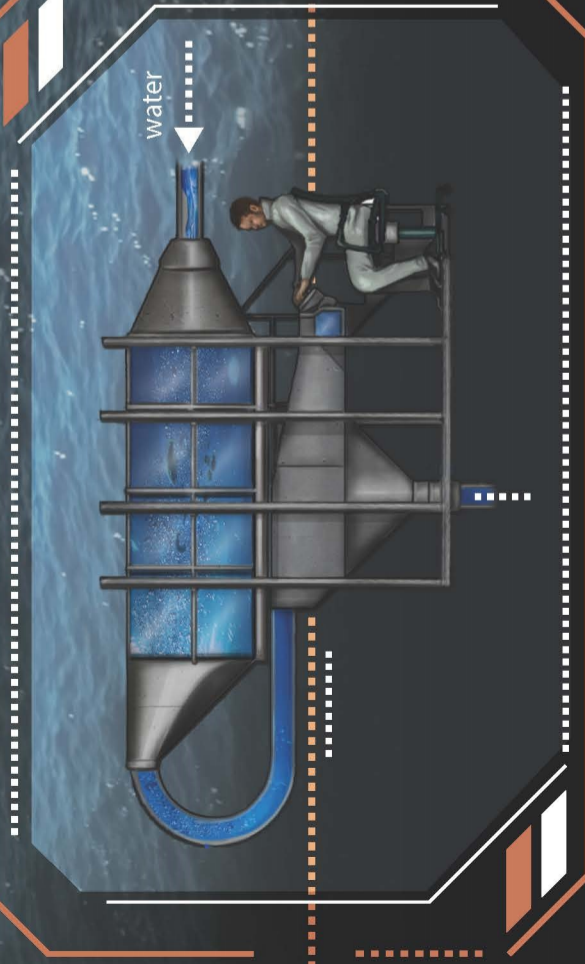
The 10.3 metre-long science tender can carry up to six people and 500 kilograms of cargo. It has a moon pool to deploy instruments through the hull and an A-frame to deploy towed instruments.

SCIENCE TENDER

WET WELL

The Nuyina's unique 'wet well' is a watertight space below the water line, that can process up to 5000 litres of seawater per minute, piped into large viewing tanks and 'filter tables', which allow aquarists to collect krill and fragile organisms like jellyfish in perfect condition.

09



Autonomous Underwater Vehicles (AUVs) are programmed to work independently under sea ice or deep beneath ice shelves. They can carry a range of instruments for different purposes, such as mapping the sea floor or under-ice surface, and measuring water properties.

10



11

Nuyina has two electric motors (7400 kW total) powered by diesel generators for silent operations and these can be coupled with two 16 cylinder diesel engines to provide maximum power for ice breaking (19,200 kW total). Two 50 metre-long propeller shafts connect the main engines and electric motors to the 40 tonne propellers at the stern.

PROPULSION

