RSV **Nuyina**

AUSTRALIA'S NEW ANTARCTIC ICEBREAKER

This publication is in celebration of Australia's new Antarctic icebreaker – RSV *Nuyina*.

RSV *Nuyina* is like a floating world, or three worlds within one ship. It is a world of science, a world of supplies and has the strength and capability to enter the world of ice.

Within these pages you will find information on the ship – and there are some great links below that will give you fabulous updates, information and images.

There is also a big jigsaw of the ship for you to colour in, cut out and keep – and some added pieces so you can create your own voyage of RSV *Nuyina*.

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AUSTRALIAN ANTARCTIC PROGRAM

Created with the great support of Australian Antarctic Division staff – Sachie Yasuda, Jessica Fitzpatrick, Wendy Paper, Rick van den Enden, Justin Hallock, Vic Doust and the RSV Nuyina Project Team.

Play the AUSTRALIAN ANTARCTIC PROGRAM **voyages**

GLUE TO THE OUTSIDE OF THE BOX

Voyages of RSV *Nuyina*

The RSV *Nuyina* is like an extraordinary floating world, carrying everything that is needed to supply and support science, the Australian Antarctic research stations (Mawson, Davis, Casey) and the sub-Antarctic station on Macquarie Island. With unlimited capabilities for science, carrying expeditioners and cargo, the ship itself is also like a floating station.

Every voyage is different. Whether the voyage is supporting one or more of the stations (incorporating science on the voyage), or the voyage is planned purely for marine science, the needs and some of the equipment for each voyage will change.

Putting together all the variations, working out what is needed and anticipating changes that can happen with the weather and ocean conditions, programs and people – is also constantly changing.

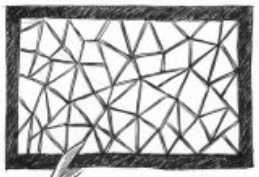
Each voyage could be seen like a jigsaw of components – and when they are all slotted together they create the full picture of a voyage. You can create a voyage jigsaw from the middle pages or change the voyage by adding extra pieces. (see page 7)

GLUE TO THE OUTSIDE OF THE BOX

Cut around solid lines

Fold along dotted lines

Putting the voyages together



Keep the cut pieces in a folder or box so you can store all your jigsaw pieces together. (for the main jigsaw)

To create the voyage puzzle – you will find the large drawing of the ship in the middle pages.

You can colour this in, or leave this black and white. Glue the puzzle to a piece of card – although not too thick as you need to cut along the darker lines to separate the pieces.

Once the box is cut and then folded, it will fold together very easily.

Glue the sides together as shown and then the lid of the box will fold inwards.

Changing the Voyage

You can cut out this shape to make a box to keep all the extra pieces (see page 7) that change the Voyage jigsaw. You need to keep these separate from the main jigsaw. You can also paste this to card to make it stronger and still have the front cover of this publication for the front of your box.

You can keep any extra things you need in the box.

GLUE TO THE INSIDE OF THE BOX

Playing the voyages

The main jigsaw is a drawing of the RSV *Nuyina* in a fictional scene of Antarctica. The plateau of ice towers behind a station based on Mawson station. Areas of sea ice float close to peninsulas of rock and snow. Mountains peek through the ice and icebergs guard the entrance to the harbour. The ship has parked close to fast ice, where there are some emperor penguins. Other animals can be seen on the ice, in the ocean, or rocks and in the air.

You can put together the jigsaw just as you would any other jigsaw, or you can challenge yourself by using some of the pieces below and play the jigsaw with friends by changing the voyage image.

If you leave all the pieces without colouring in, all the jigsaw pieces will match easily. But if you would like to colour them all, try colouring the main puzzle first and when you use the added pieces you can colour them to match as you go.

Putting together the voyage jigsaw with others can be made into a challenge by simply dividing up the pieces between the players. Turn each piece upside down and take turns to place a piece on to the jigsaw.

If the player can't find where the piece would fit, it should be left (image side up) with the player's other pieces until it can be used. Each player can only turn over one piece each turn. Keep going like this until the voyage is finished.

Another way to play the main voyage is to use a dice. Make a large pool of the pieces on a table. The pieces should all be face down. Each player should throw the dice and the one with lowest number can move first, then the second highest and so on, until you have the order of play set.

The first player then throws the dice and takes the number of pieces from the pool that is shown on the dice. The player can then turn over the pieces and use any or all of them if there is an obvious place to fit. The left over pieces remain face up with the player and can be used for another turn.

As the voyage puzzle progresses and each player throws the dice, the player may wish to use one of their spare pieces instead of picking from the pool, or do a combination of both.

Voyage rules

All voyages need co-operation from everyone to help to achieve tasks. If you play the voyage jigsaw (as opposite) or play by adding some of the pieces below, when you are close to completing the voyage, you may need to co-operate with other players by swapping pieces and helping each other along the way.

Below are twelve illustrated pieces and seven blank pieces. The illustrated ones can be used to change certain parts of the voyage scene. Some will slot in to the scene by themselves and others will join up. They all display some activity on the ship or undertaken by expeditioners in the field.

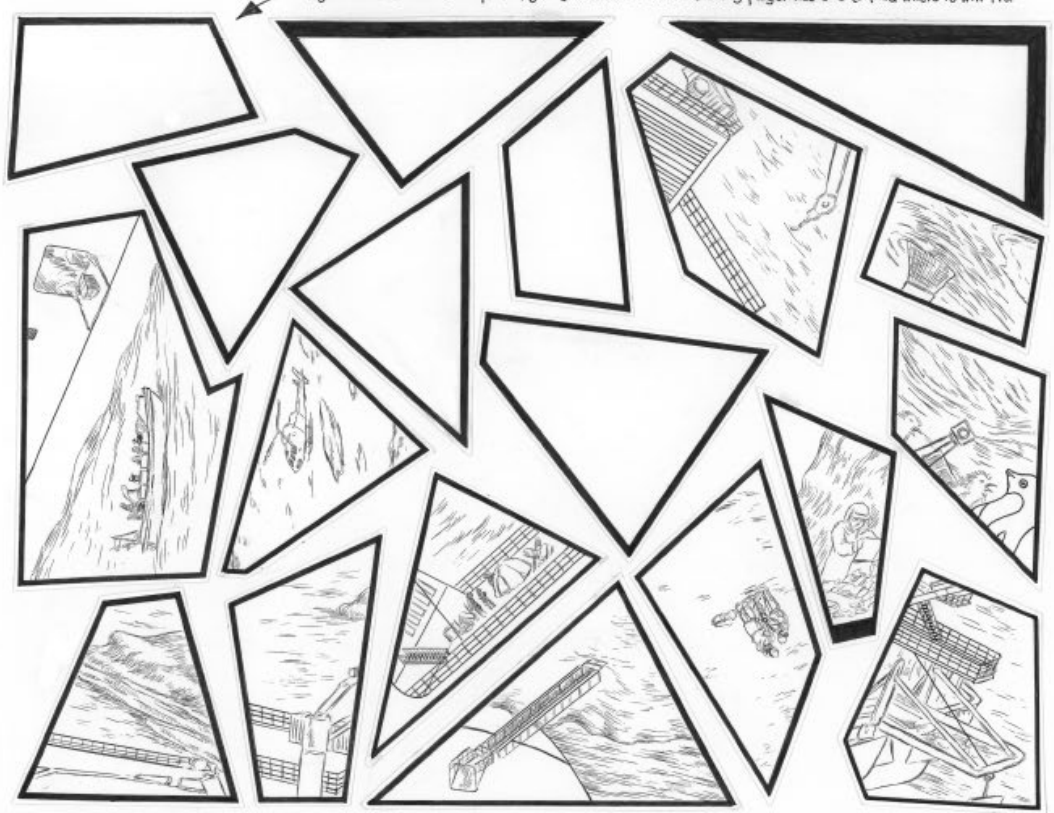
Paste the panel of pieces to card then cut around each piece. (You can colour them in as you use them to match the main puzzle, or do this before you cut them out). When they are pasted to card, turn them over and label them 1-6. You will end up with two of each number.

The blank pieces are for you to add your own illustrations. You could change the weather, add some animals, take them away, change the ice conditions and add scientists working in the field.

You can make your own pieces by tracing around the jigsaw shapes.

Playing – Use the same rules to start and finish (as opposite). To change a voyage you can use the number on any throw to add one of your numbered pieces. (Some will need the co-operation of others to complete the scene). If you would like to add in the blank pieces, number them as the others. Then you can choose to use this instead of another in your pile and draw on it, as the play progresses.

If you choose to use these pieces, you could make sure that every player has one to find where it will fit.



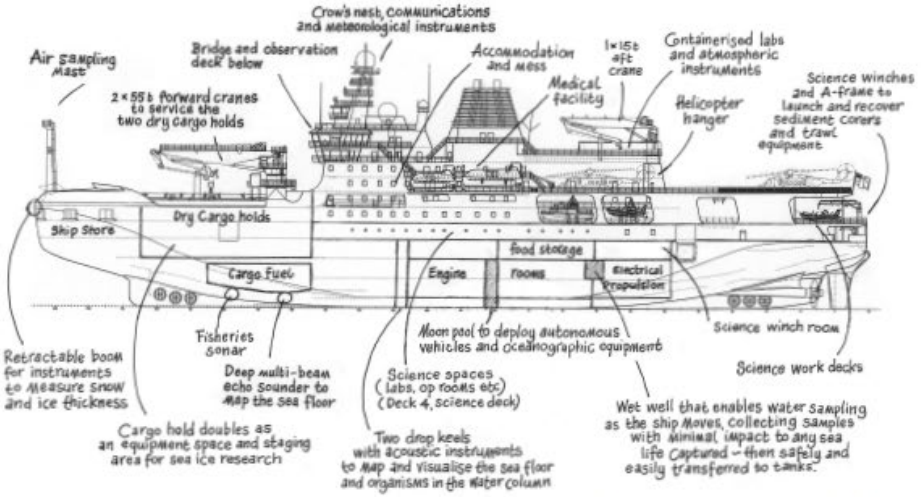
RSV *Nuyina*

AUSTRALIA'S NEW ANTARCTIC ICEBREAKER

Australia's new Antarctic icebreaker, RSV *Nuyina*, will make its maiden voyage to Antarctica from its home port of Hobart in 2020.

Nuyina is a Tasmanian Aboriginal word meaning 'southern lights'. It is pronounced 'noy-yee-nah'.

The southern lights, also known as aurora australis, is an atmospheric phenomenon which forms over Antarctica and reaches northwards to light up Australian – and particularly Tasmanian – skies. The ship was named by Australian schoolchildren in a competition in 2017. The *Nuyina*, is really three ships in one – an icebreaker, a floating scientific research platform, and a resupply ship. The *Nuyina* is truly a ship of the future. It has been designed for the science we use today and for the science of tomorrow – including science that has not yet been invented!



The *Nuyina* is built from 10,000 tonnes of steel and painted bright 'international orange'.

In icebreaking mode the ship can break 1.65 metre-thick ice at three knots. The ship's bow has a shape that allows it to ride up on to the ice. Then the weight of the ship and the bow, push down on the ice, breaking it like you would a chocolate bar.

When the ship is breaking ice it makes a lot of noise. However it needs to be very quiet for some types of scientific work that use sound to map the sea floor or to look for krill and fish in the water below.

To create a silent ship, engineers had to design a special propulsion system that changes the way bubbles form and move around the hull. Bubbles make a lot of noise when they pop! The ship also has quiet electric motors for silent operations, while two big diesel engines take over in icebreaking and seagoing mode.

Scientists on the *Nuyina* are lucky to have a 'wet well' – a unique area to process seawater for krill and marine organisms. Seawater feeds into the wet well and flows to large viewing tanks and filter tables. Scientists can collect marine organisms alive and place them in aquariums for further study.

Nuyina can carry 4 small (B3s) helicopters or 2 medium (S92s)

The Science tender is a craft that functions as a mobile research platform.

3 passenger tenders can carry small stores.

Nuyina has two barges that can carry all sorts of goods from ship to shore and return, with 45t capacity.

The ship also has a 'moon pool' to deploy scientific instruments, nets and robotic vehicles. This 4 metre-wide, 13 metre-long vertical shaft runs from the science deck through to a hatch in the hull.

The *Nuyina*'s other important role is as a heavy lifter. It can carry up to 1200 tonnes of cargo below deck in 96 20-foot shipping containers. Further containers and large items can be carried on top of the cargo holds, and another 30 containers can be stored on the science deck and around the ship. The ship can also carry 1.9 million litres of fuel, to refuel up to two Antarctic stations in one voyage.

In the drawings on this page you can also see the barges, small watercraft and helicopters the *Nuyina* can carry, to provide additional capability for science and resupply operations.

No other vessel in the world can deliver the combination of icebreaking, science and logistics capabilities that the Nuyina can today!

Ship-shape stats

The RSV Nuyina can:

- Break 1.65 metre-thick ice at 3 knots
- Cruise efficiently at 12 knots, with a maximum speed of 16 knots
- Handle waves over 14 metres high (sea state 9)
- Handle hurricane-force winds (Beaufort 12)
- Operate between -30°C and up to 45°C
- Support voyages up to 90 days
- Carry 117 expeditioners and 32 crew

The **Australian Antarctic Program** aims to answer big scientific questions about the icy continent like: how does Antarctica and the Southern Ocean drive global climate? By studying the region, we can unlock the secrets of the past and predict future changes.

To support our scientific research, Australia has three year-round research stations, Casey, Davis and Mawson, and one on sub-Antarctic Macquarie Island. The population of the stations is up to 100 expeditioners over summer and about 20 over the harsh winter months.

The stations are run by a team of Antarctic expeditioners including station leaders, tradespeople, aviation teams, doctors, chefs and telecommunications experts. Back in Hobart head office staff support the stations and Australia's presence in Antarctica with experts in Antarctic policy, law, operations, medicine and science.

Antarctica is the most remote and challenging part of the planet, but our new icebreaker RSV Nuyina is well equipped to navigate the wild storms and frozen waters between Australia and Antarctica.

Each year the icebreaker makes annual resupply voyages to each research station, delivering all the things that will be needed for a whole year!

Everything that you need must be taken to Antarctica. Everything. Just think of what you will use today - from when you first wake up until you go to sleep – and then imagine making sure all of this is available on the ship or at Australia's research stations.

For many years the idea of a land at the bottom of the world was impossible to imagine. Some civilisations saw the large oceans that surrounded them as endless horizons with endless possibilities and built watercraft to weather the storms, waves and the unknown.

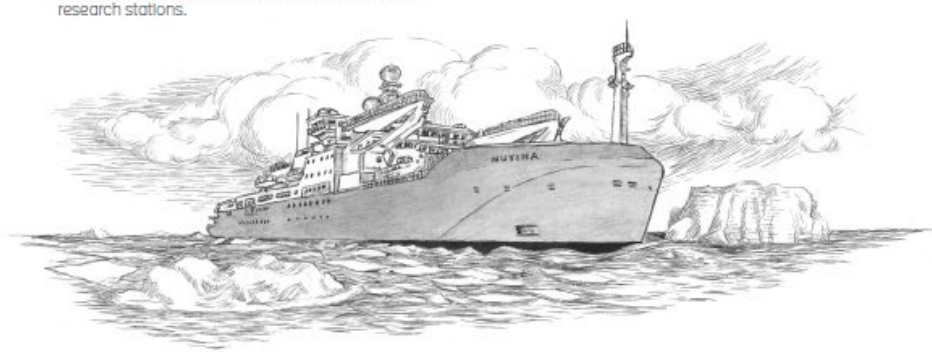
Some people believed if you sailed too far you would fall off the edge of the Earth. While others ventured forth and followed the stars, learning their patterns, tracing their movements, describing the Earth as round. They thought there must be other lands to the south to balance their home lands in the north.

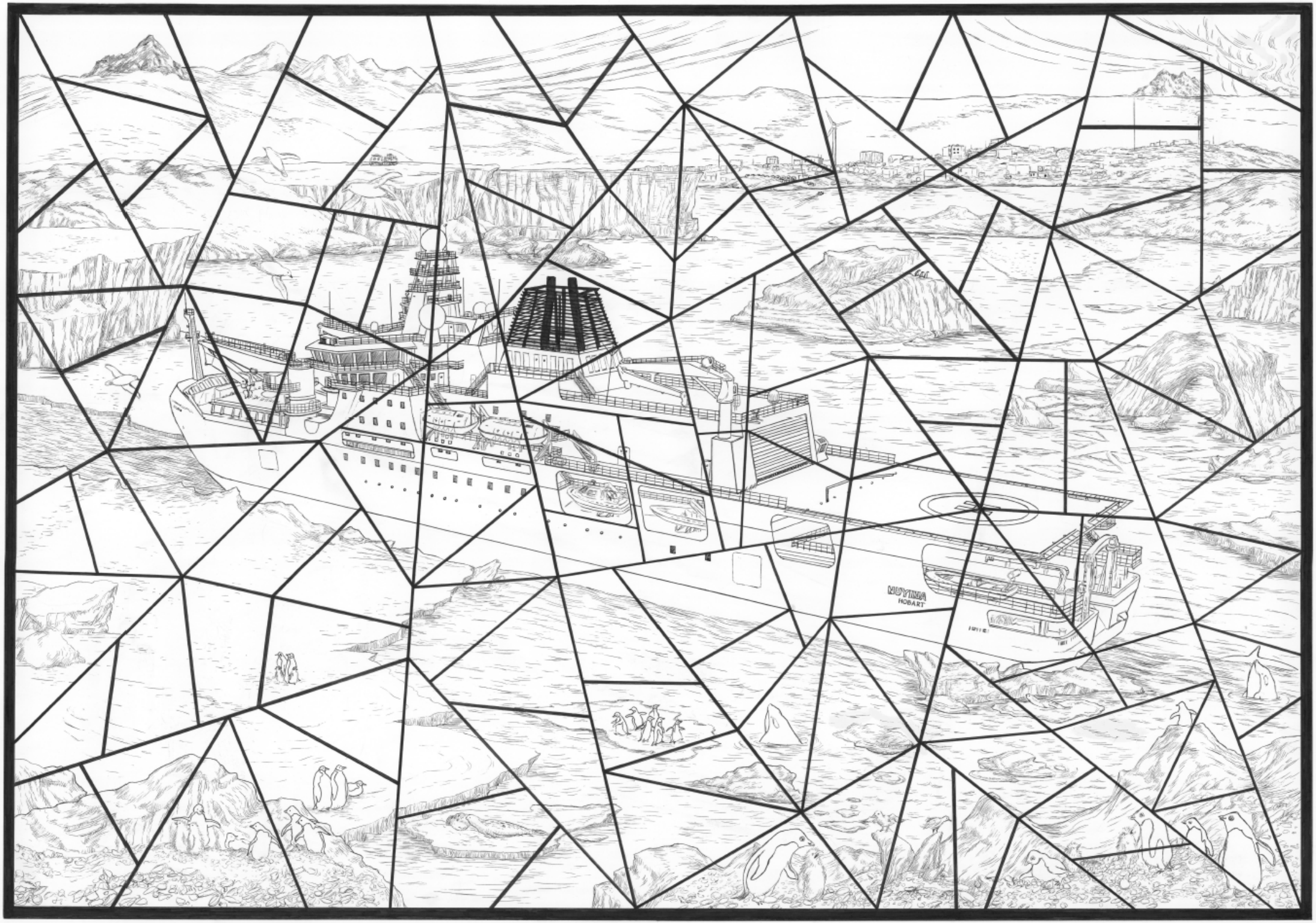
The first explorers to break through the ice-bound seas of the south found a land also covered in ice.

These voyages of discovery were achieved spurred on by the curious and passionate minds of scientists.

They documented everything they could of this new place, drawing, writing, mapping and taking measurements and samples. They planted flags for their nations, but returned home with more than a conquest of the new, they came back with knowledge that in this place they could find answers to things not yet known.

Today, we continue that legacy. Antarctica is a natural reserve devoted to peace and science and still holds many secrets yet to be discovered.

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