

# Features of the Deep-sea Scientific Drilling Vessel *Chikyu*

*Chikyu* is a research vessel designed to investigate sub seafloor geology and geobiology. *Chikyu* does this through drilling, lowering drill pipe and drill bit through the water column to the sea floor, and then drilling down to collect data and samples. The maximum operating water depth is 7,000 m (2,500 m when using riser pipe) and then the maximum drilling depth is up to 7,000 m below sea floor.

## Derrick & Drill floor

The derrick is where all drill pipe is assembled and controlled, and the moon pool below is where all drilling equipment are lowered into the sea. Control of all the drilling operations is centered in the Driller's House on the drilling floor.



Derrick



Drill floor



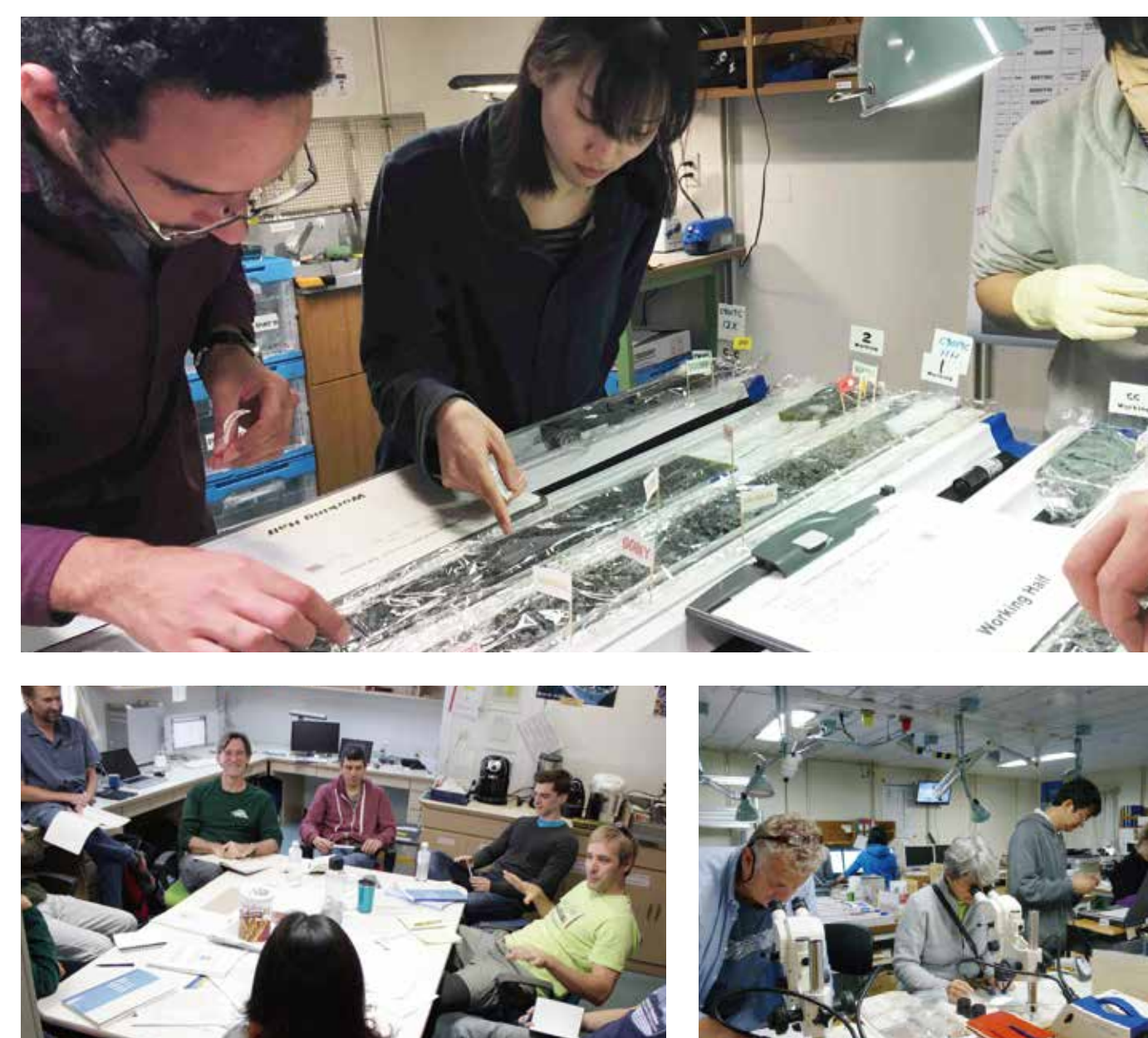
Moonpool



Drillers house

## Laboratory

This is where the samples and data are analyzed and studied by scientists.



## Helicopter deck

This is where scientists and crew embark and disembark from *Chikyu* during expeditions. The permits *Chikyu* to stay on site, drilling, while crew changes occur.



## Bridge

This is where *Chikyu* is commanded from; the Captain and his officers control all ship-movements from here.



## Tools for drilling

### Drill pipe

Special steel pipe that helps push the drill bit so it can dig deeper into the formation. It is rotated from the ship, and is hollow, so drilling mud can be pumped down through it.

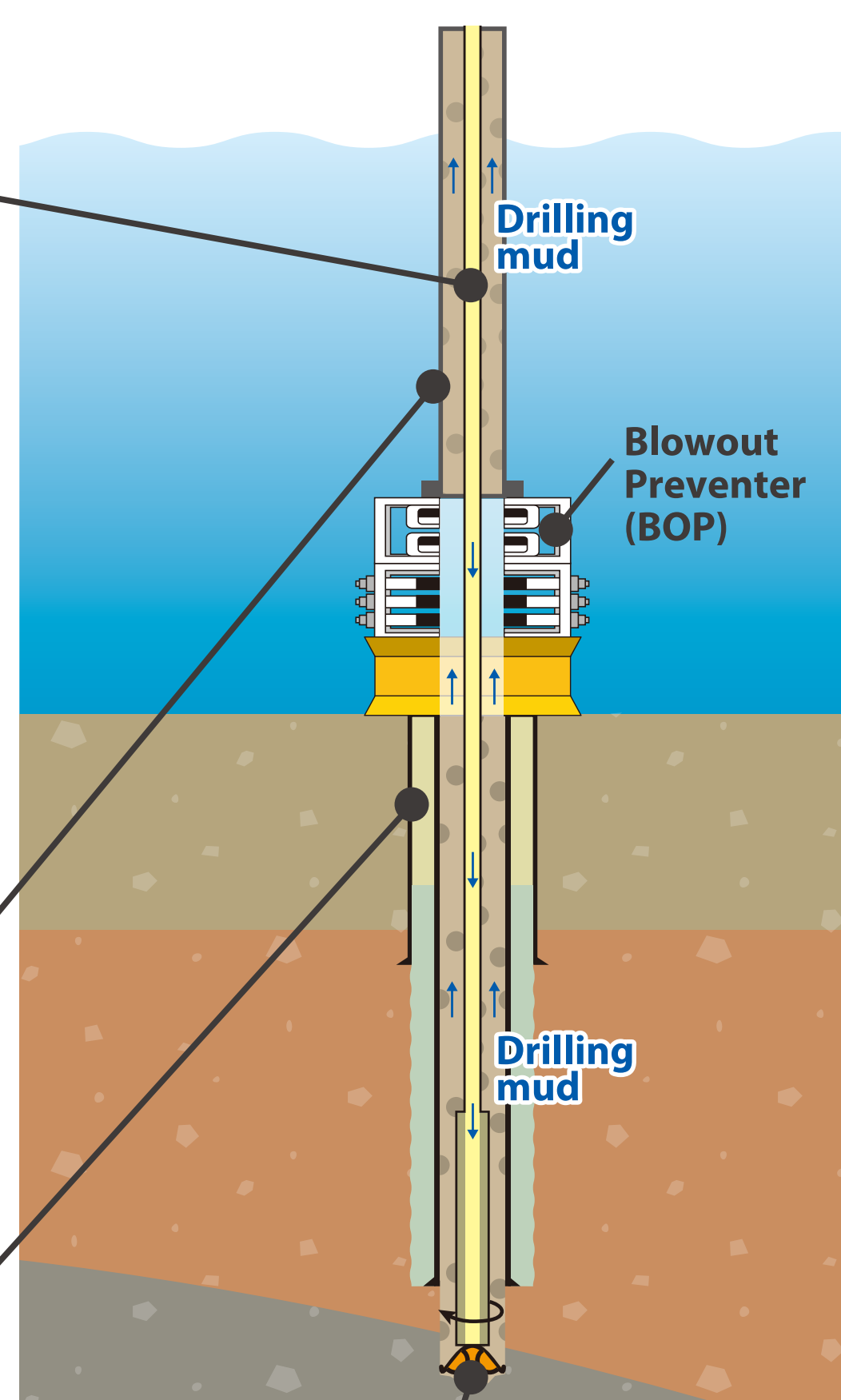
### Riser pipe

A large diameter tube to connect *Chikyu* and the seafloor. This allows for pressure control, for safety, and also enables drilling fluid circulation back to the ship.



### Casing pipe

This is special, large-diameter pipe designed to prevent borehole collapse.



### Drill bit

This special head-piece, which has cutting grooves and teeth, suited for specific formations, is used to cut the rocks and sediments.



### Core bit

This is a special drill bit designed to cut core samples from sediments or rocks.



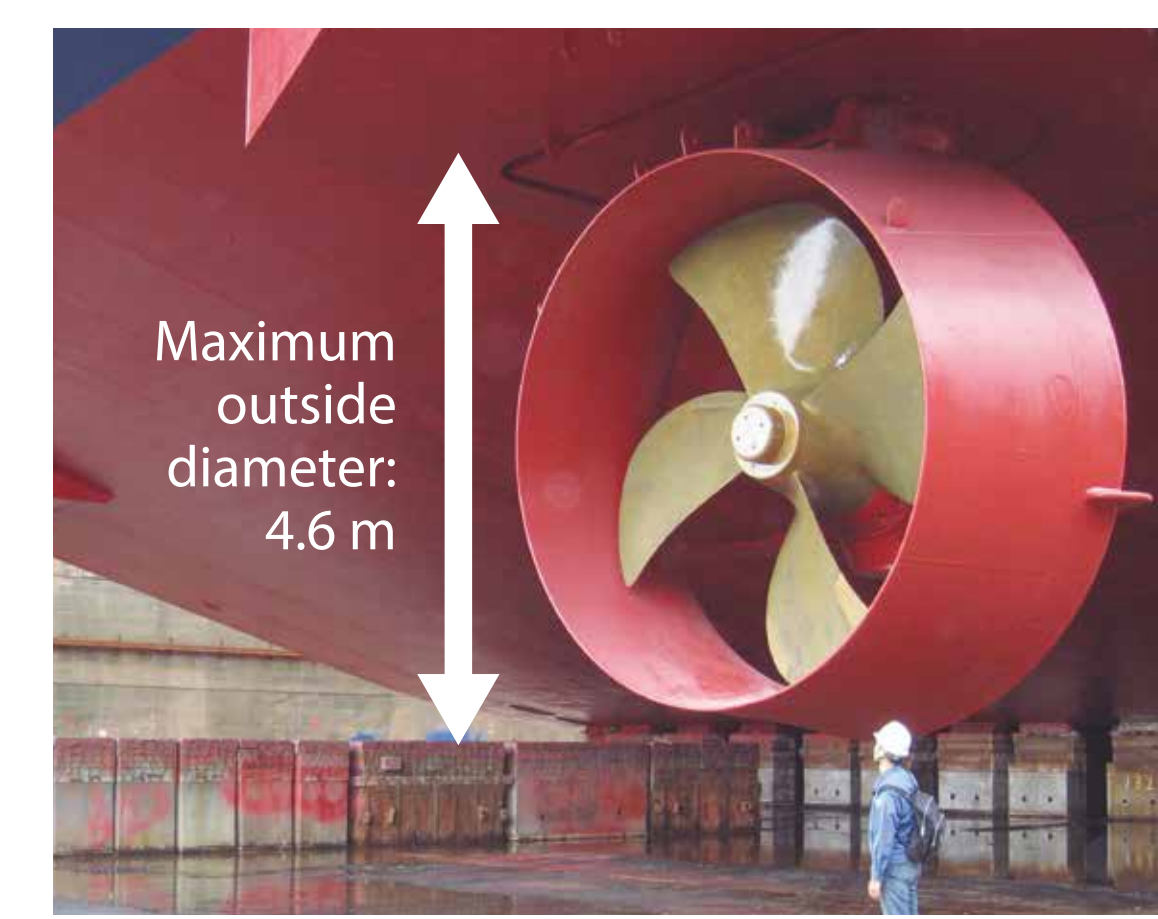
## Blowout Preventer (BOP)

This safety equipment is installed at the seafloor to control down-hole pressure and prevent dangerous high-pressure kickbacks from the formation.



## Azimuth thrusters

These large propeller pods can rotate 360°. Each of the 6 azimuth thrusters (4.6 m diameter each) on *Chikyu* are electrically powered, and work together, with GPS and the Dynamic Positioning System, to keep *Chikyu* in position, against the influence of ocean currents and winds.



Maximum outside diameter: 4.6 m

## *Chikyu* specifications

Length	210 m
Beam	38.0 m
Height (From ship bottom)	130 m
Gross tonnage	56,752 tons
Cruising speed	12 knots (22 km/hour)
Complement	200 people
Propellers	Azimuth thruster 4,200 kW (5,710 PS) x 6 Bow thruster 2,550 kW (3,470 PS) x 1

