

SCHMIDT



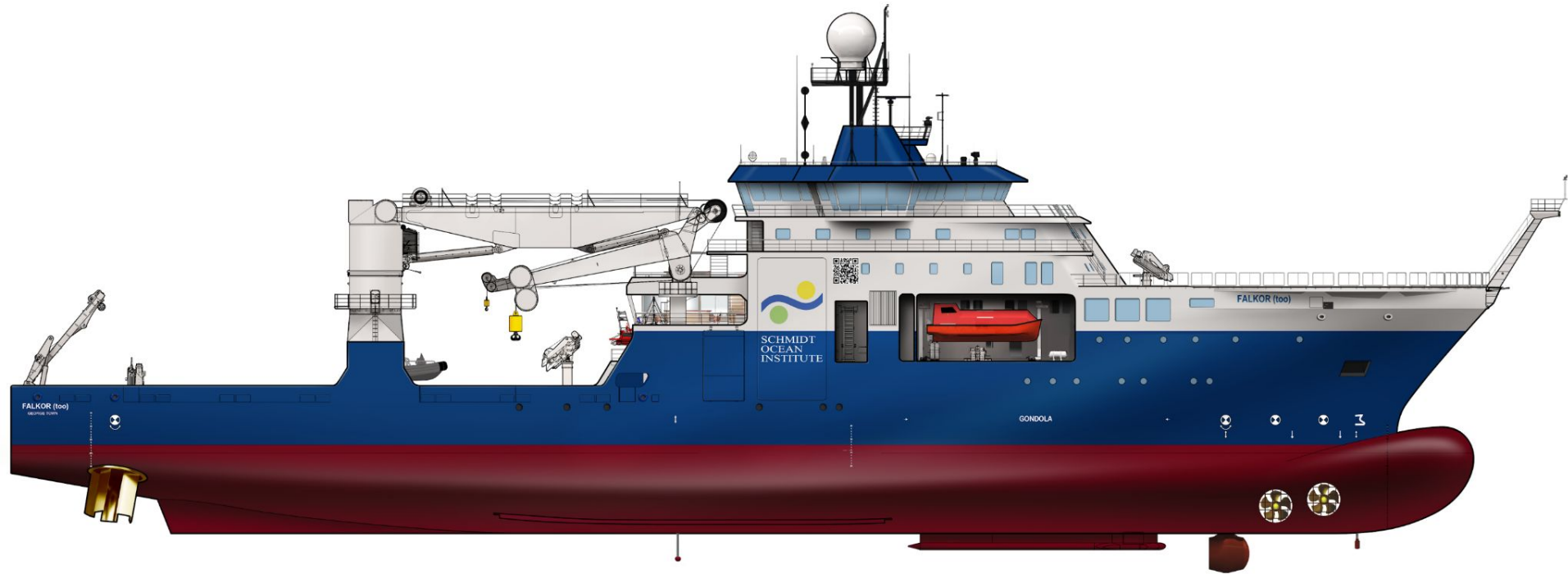
OCEAN
INSTITUTE



DeSSC - February, 2024

Stian Alesandrini

R/V *FALKOR* (too)





FALKOR (too)

SCHWABT
OCEAN
INSTITUTE

000000

Specifications

LOA	111 meters
Beam	20 meters
Gross Tons	7,257
Labs	8 science spaces
Cranes	9 cranes, up to 150 tons AHC
Moon Pools	2 (Hangar 5.2m x 5.2m) (Aft Deck 7m x 7m)
Open Deck	892 square meters
Fuel Capacity	1,715 cubic meters
Engines	10.8 mW (6 MAN 9 cylinder @ 1,800 kW each)
Thrusters	5 (Bow - 2 tunnel, 1 drop keel) (Stern - 2 cycloidal pitch props)
Science Sonars	3 MBES, 3 ADCP, 6 bioacoustic, sub-bottom profiler and more
Class & Flag	DNV - DP2, ICE-C Cayman Islands
Crew	28 + 8 ROV Technicians - 60 days on/off

SCIENCE ON R/V *FALKOR (too)*



Eight Labs



>5x Lab Space



75% increase in Met & Marine Underway Sensors



+2 MTs

Falkor	Square Meters	Falkor (too)	Square Meters
Dry Lab	25	Seawater Lab	25
Wet Lab	30	Main Lab	105
Lower Wet Lab	5	Wet Lab	25
		Hydro Lab	30
		Dirty Wet Lab	10
		Computer and Electronics Lab	60
		Cold Lab	20
		Robotics Lab	30
Total	60	Total	305



R/V FALKOR (too)

Gondola and Sonar Configuration

Seafloor Mapping

Multibeam technology sends hundreds of individual beams in a fan shape below the ship to paint a 3D image of the seafloor.

- **Shallow Water Multibeam:** 1m - 600m
- **Medium Water Multibeam:** 3m - 3,600m
- **Deep Water Multibeam:** 5m - 11,000m

Listening

Hydrophones act as our ears underwater, listening to nearby sounds, whether they be from ships, sonars, or marine life.

- **Hydrophones:** 24 - 500 kHz

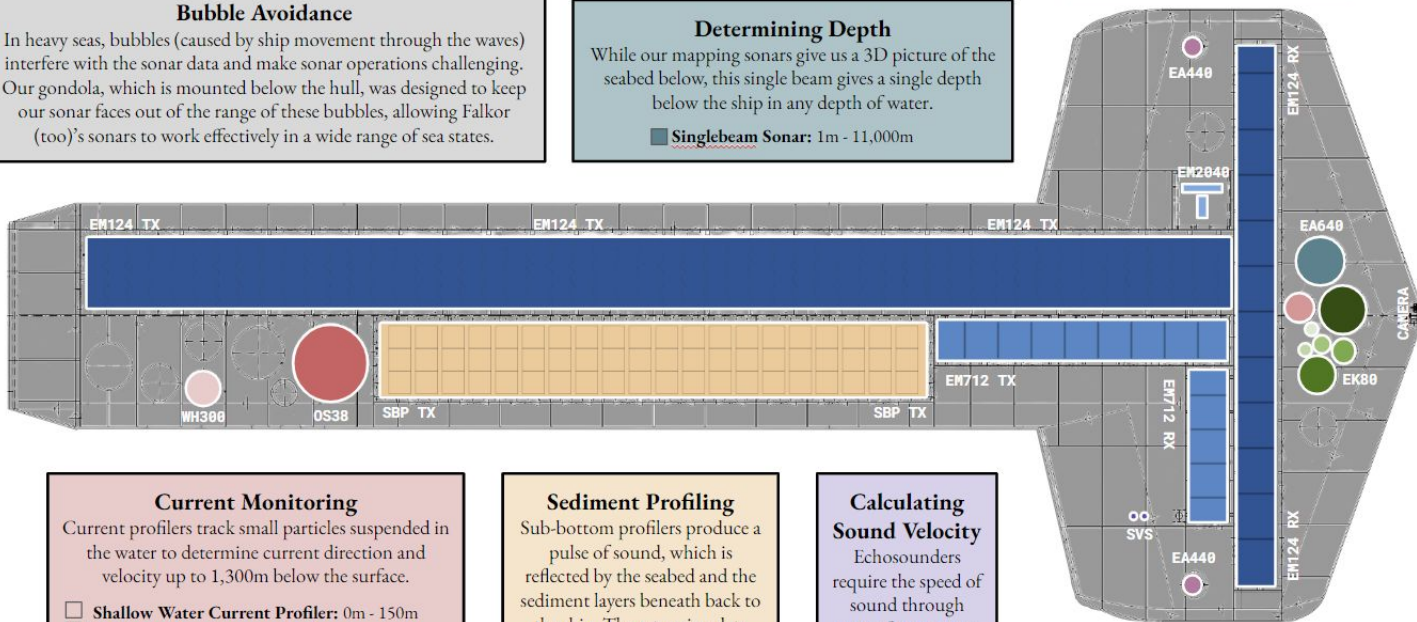
Bubble Avoidance

In heavy seas, bubbles (caused by ship movement through the waves) interfere with the sonar data and make sonar operations challenging. Our gondola, which is mounted below the hull, was designed to keep our sonar faces out of the range of these bubbles, allowing Falkor (too)'s sonars to work effectively in a wide range of sea states.

Determining Depth

While our mapping sonars give us a 3D picture of the seabed below, this single beam gives a single depth below the ship in any depth of water.

- **Singlebeam Sonar:** 1m - 11,000m



Current Monitoring

Current profilers track small particles suspended in the water to determine current direction and velocity up to 1,300m below the surface.

- **Shallow Water Current Profiler:** 0m - 150m
- **Medium Water Current Profiler:** 1m - 400m
- **Deep Water Current Profiler:** 1m - 1,300m

Sediment Profiling

Sub-bottom profilers produce a pulse of sound, which is reflected by the seabed and the sediment layers beneath back to the ship. The returning data reveals layers of sediment up to 200m below the seabed.

- **SBP 29:** 1m - 11,000m & up to 200m of sediment penetration.

Calculating Sound Velocity

Echosounders require the speed of sound through water for accurate depth and distance calculations. Falkor (too)'s SVS offer real time sound velocity at the sonar faces.

Fish-Finding

Our suite of midwater sonars help us identify biomass, both large and small, in the water around us.

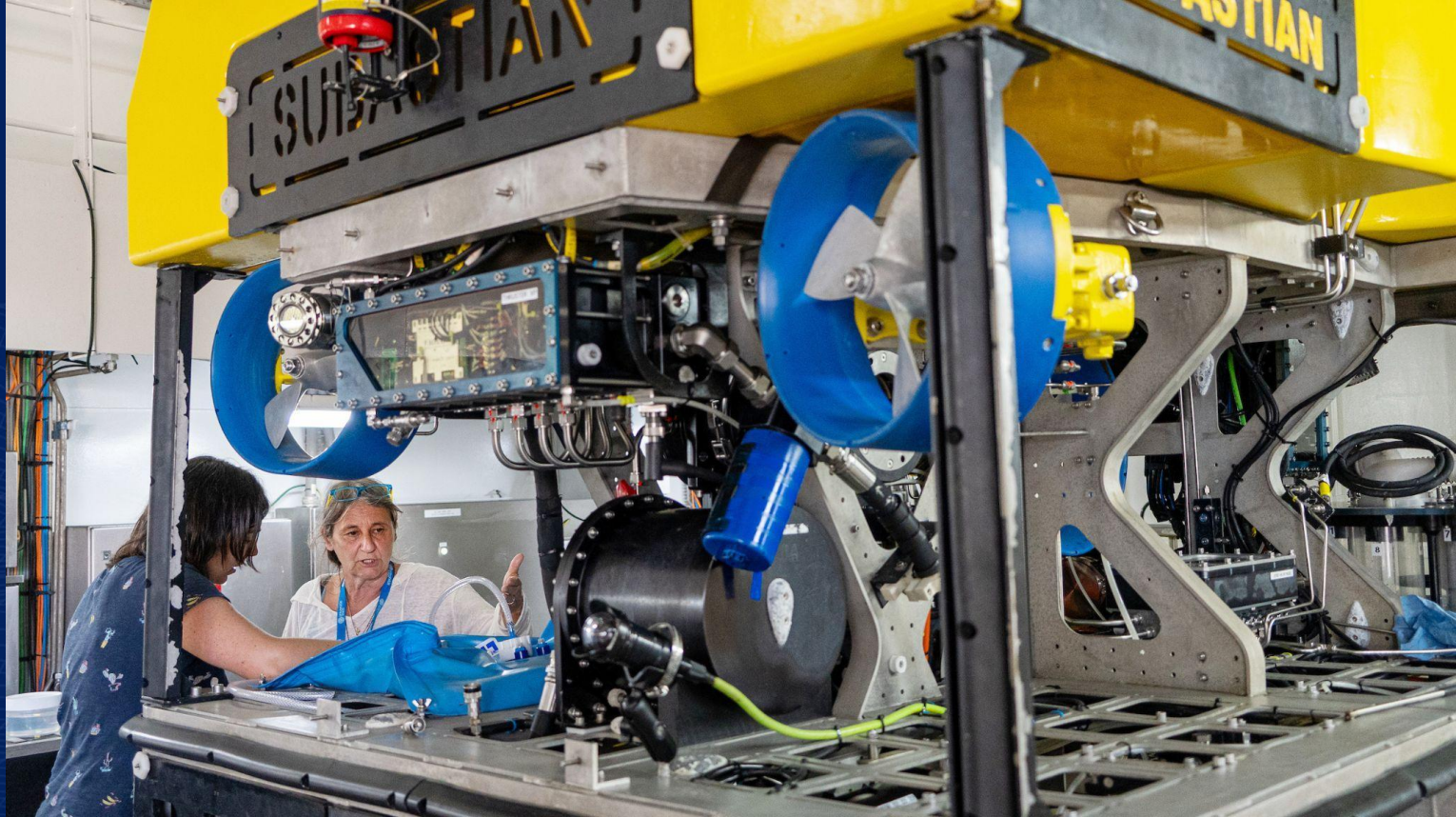
- ■ ■ ■ ■ ■
- Sonars:** 16, 38, 70, 120, 200 & 333kHz





ROV SuBastian









ROV SuBastian Specs

- Custom built in 2016
- Over 650 total dives
- Maximum depth: 4500 meters
- Top speed: 3 knots
- Dimensions: 2.7×2.2×1.8 meters
- Weight in air: 3200 kilograms
- Payload capacity: 200 kilograms
- Situational Video – Insite Pacific Mini Zeus, HD
- Science Camera – SULIS Subsea Z71, 4K (12X zoom)
- HD Cameras (4) – DSPL FlexLink HD Multi SeaCam

ROV SuBastian Sampling Systems

Sensors

- CTD
- Oxygen Sensor
- Temperature Probe
- pH Sensor
- Sound Velocity Sensor

Acoustics

- Tritech – Super SeaKing DST
- Teledyne – Blueview M900
- Kongsberg - M3

Sampling Equipment

- Suction Sampler
- Push Cores
- Niskin Bottles
- Bio Boxes
- Rock Boxes
- Vibracore

ROV SuBastian 2022 Rebuild

ROV Inspection, Repair & Maintenance (IRM)

- Mechanical, Hydraulic, Electrical & Electronic systems
- Thrusters
- Manipulators
- Valve packs and junction boxes
- Science equipment, tooling & sensors
- Sub motor rewind
- ROV hydraulic pump service

Upgrades

- New 6000m Umbilical
- 4K science camera upgrade to a Sulis Z71
- New ROV light junction boxes
- New manifolds & oil/water separator

ROV SuBastian

Science Integrations

Connections

- Serial Ports
- 10/100 and Gigabit Ethernet
- Fibers for direct data transfer
- 12/24 VDC
- 230/115 VAC
- Hydraulic rate valve pack channels
- Hydraulic servo valve pack channels
- Proportional hydraulic valve circuits

2023 Integrations

- Raman Spectrophotometer
- InSAS
- Hydrothermal Fluid Sampler
- Methane Spectrophotometer
- Magnetometer
- Solaris
- Heat Flow Probe
- In Situ Mass Spectrometer
- SUPR Suction Sampler
- Voyis Laser Scanner
- Stereo Cameras
- And many more...

Falkor (too) and SuBastian 2023

- Falkor (too) sea trials
- 9 expeditions with 223 days of science, starting in March
- Traveled 39,280 km
- Mapped 190,025 km²
- 143 dives with ROV SuBastian, totaling 2,053 hours
- 213 CTD casts
- Collected 2,826 samples and 269 TeraBytes of data
- 27 scientific publications and more than 4,000 articles

SCIENCE TOPICS



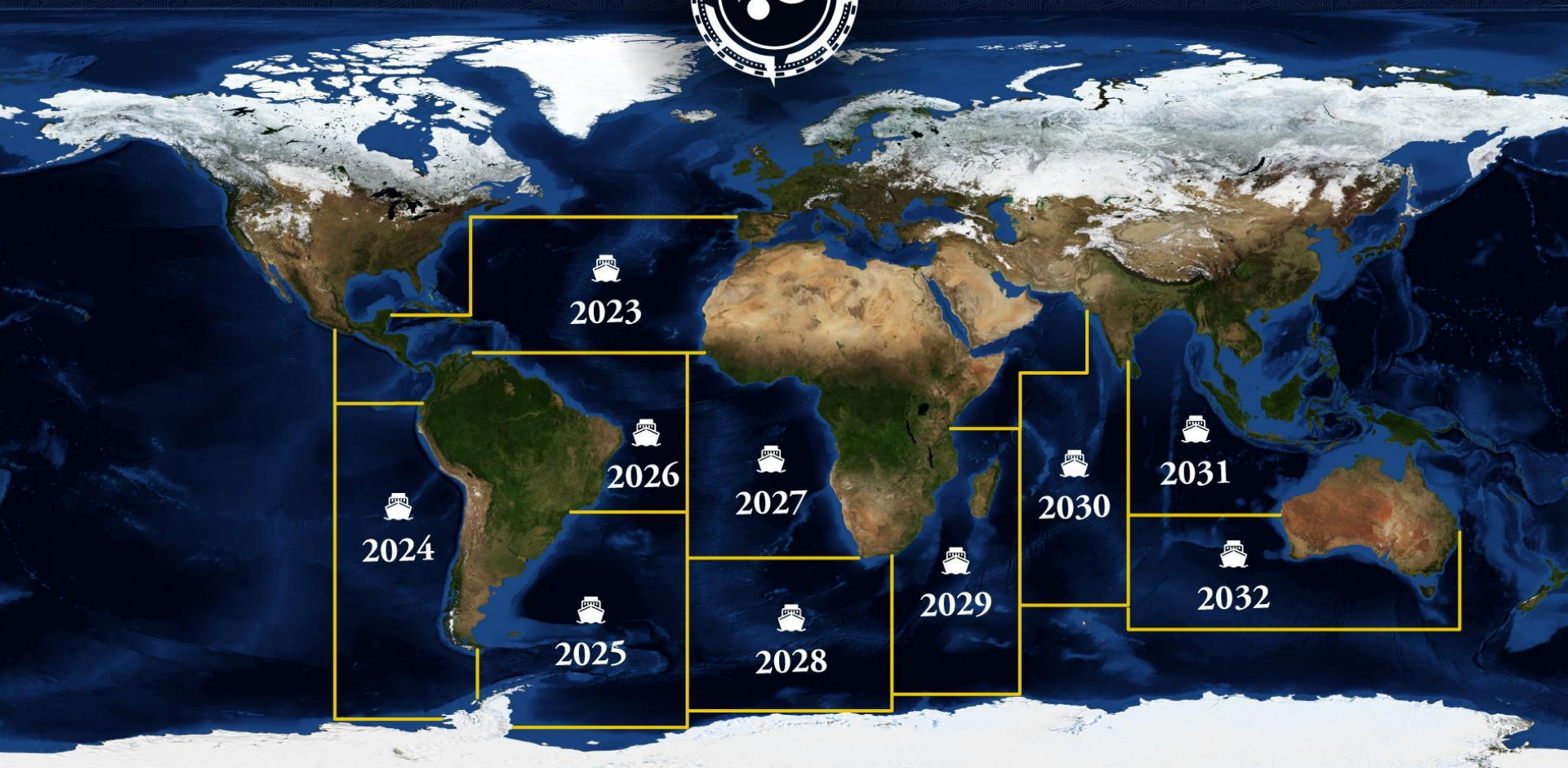
One Ocean

Seven Continents



One Decade

Seven Topics




2023


2024


2026


2025


2027


2028


2029


2030


2031


2032

Thank you



FALKOR (12.8t)

Schmidtocean.org

