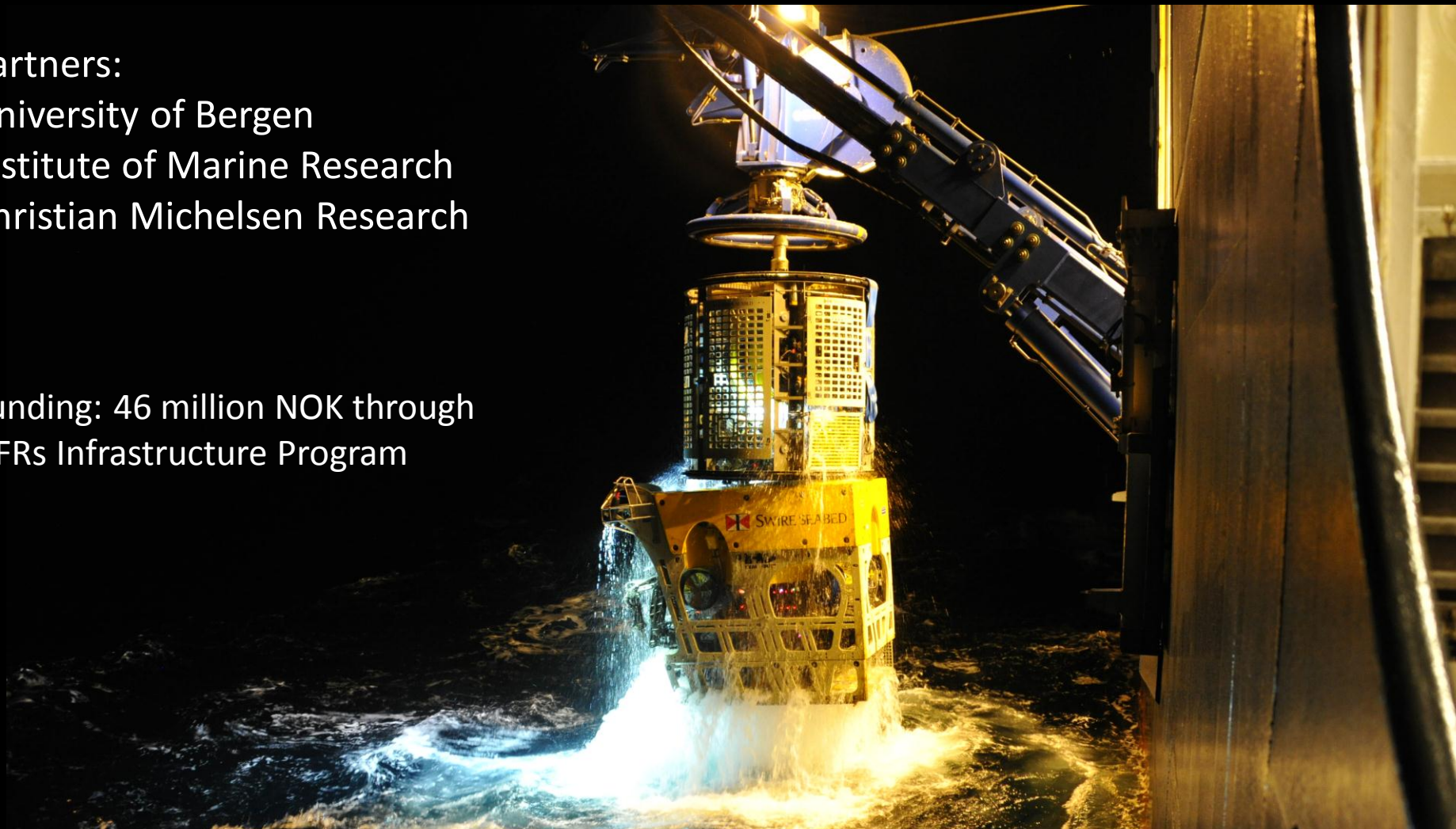
Norwegian Marine Robotics Facility
ROV for
Deep Sea Research

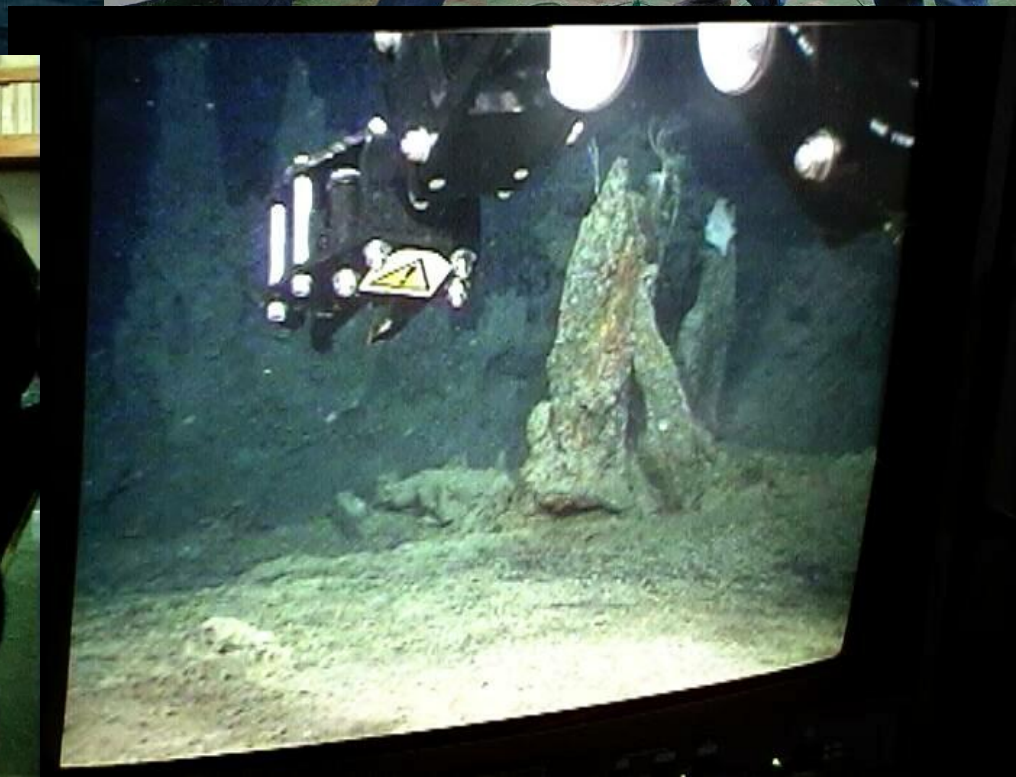
Partners:
University of Bergen
Institute of Marine Research
Christian Michelsen Research

Funding: 46 million NOK through
NFRs Infrastructure Program



Background - Deep Sea Research at UiB

SUBMAR program
1998-2003
ROV Aglantha
1997 – 2014

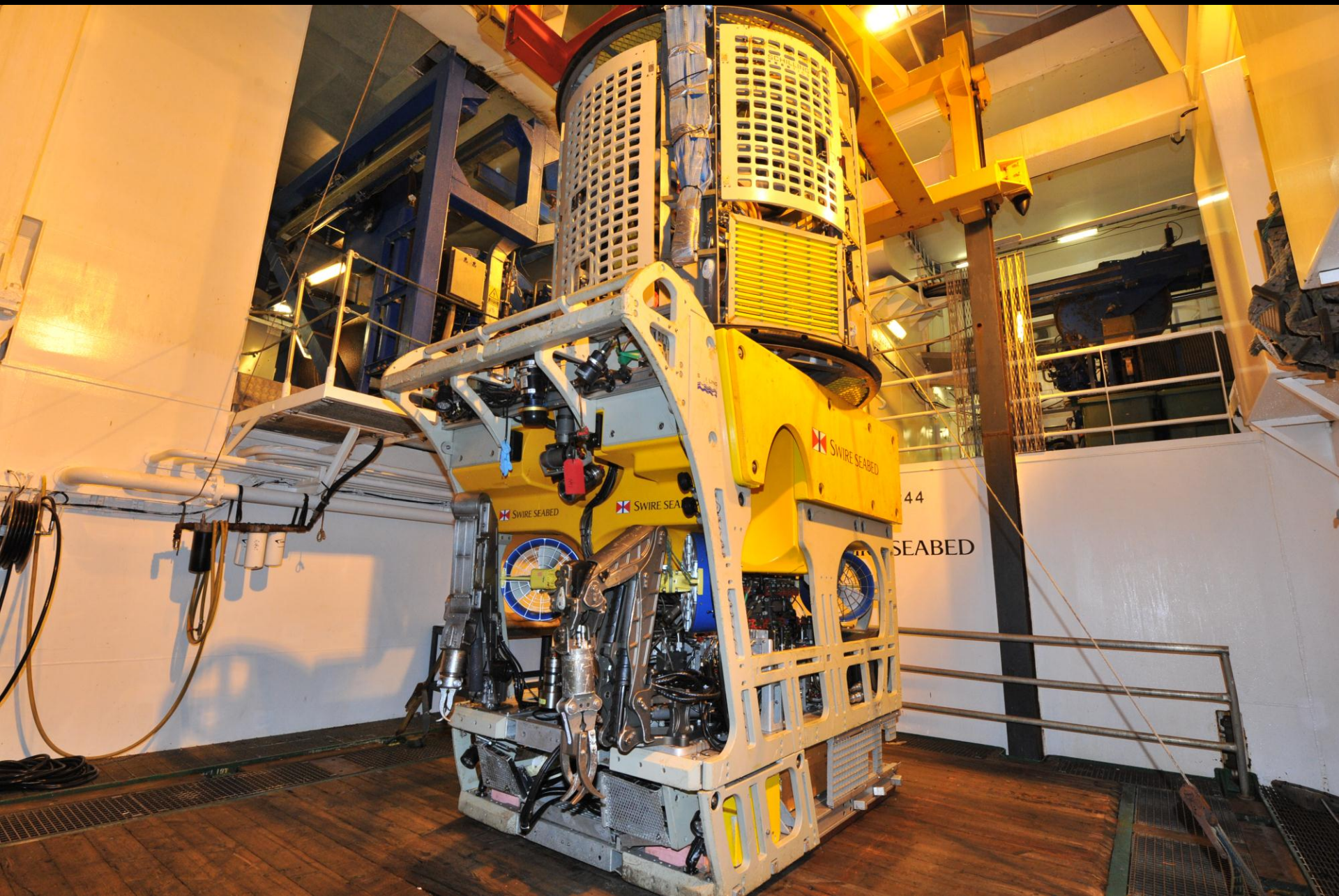


MAR-ECO Program 2003-2010

2003 - Development of a New ROV

Collaboration with Argus Remote System

Bathysaurus


SWIRE SEABED
SWIRE SEABED
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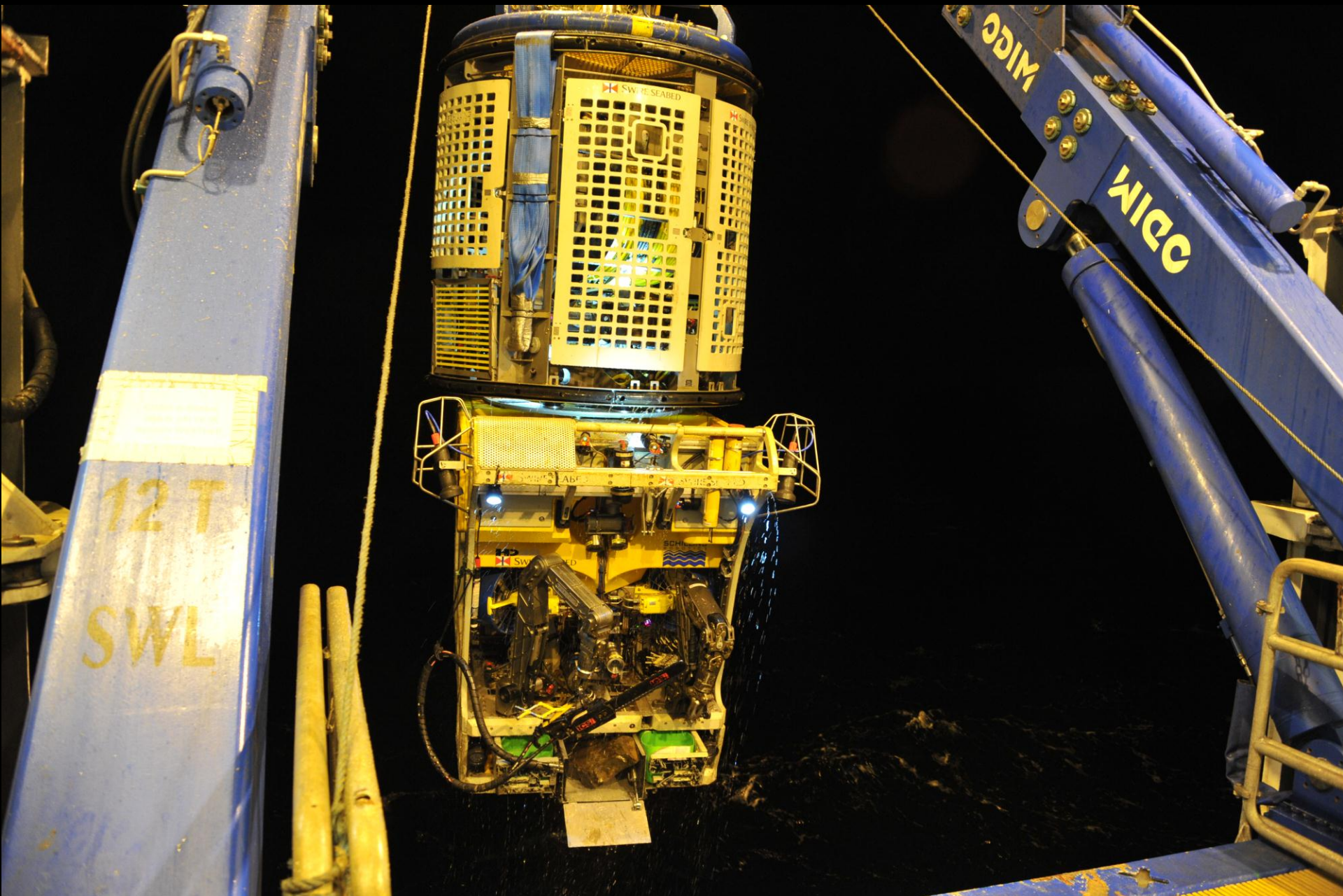
SEABED


Do not switch on
nder maintenance
SWIRE SEABED


ODIM
FOOD
GLASS METAL
PLASTIC PAPER


12 T
SWL
ODIM
WIRE

Budget: NORMAR - Deep-Sea ROV-system with Scientific Payload	
ROV-system	
6000 m ROV with control and maintenance systems, extra shallow water buoyancy	17950
Tether Management System (TMS)	3800
LARS (large winch, small winch, docking head and modification crane G.O. Sars)	15000
Spare part package ROV and LARS	1750
Installation and delivery	800
Sum ROV complete system	**39300**
Scientific payload	
Acoustic systems (multibeam echo sounder, sub bottom profiler)	2600
Optical instrumentation (HD video, still camera with flashes)	900
Sensors (CTD, turbidity, fluorescence, oxygen, temperature)	400
Samplers (water, bio, sediment, rock)	1100
Sum scientific payloads	**5000**
Total costs ROV system and payloads	**44300**
Costs establishment phase (2 years)	
Personnel costs	
Engineering services, training of personnel (NFR)	900
1 year salary for technical engineer/manager (partners - UiB)	900
2 years salary for 3 engineers/ROV-operators (33% positions) (Partners - HI)	1500
Other costs	
Special equipment for workshop, cranes etc. (NFR)	500
Rental cost of storage/workshop facility (partners)	360
Sum costs establishment phase	**4160**
Total cost infrastructure + running cost establishment phase	**48460**
Funding	
Partners contribution establishment phase	2760
Total NFR funding	45700
Sum	**48460**

Research Vessels for ROV operations

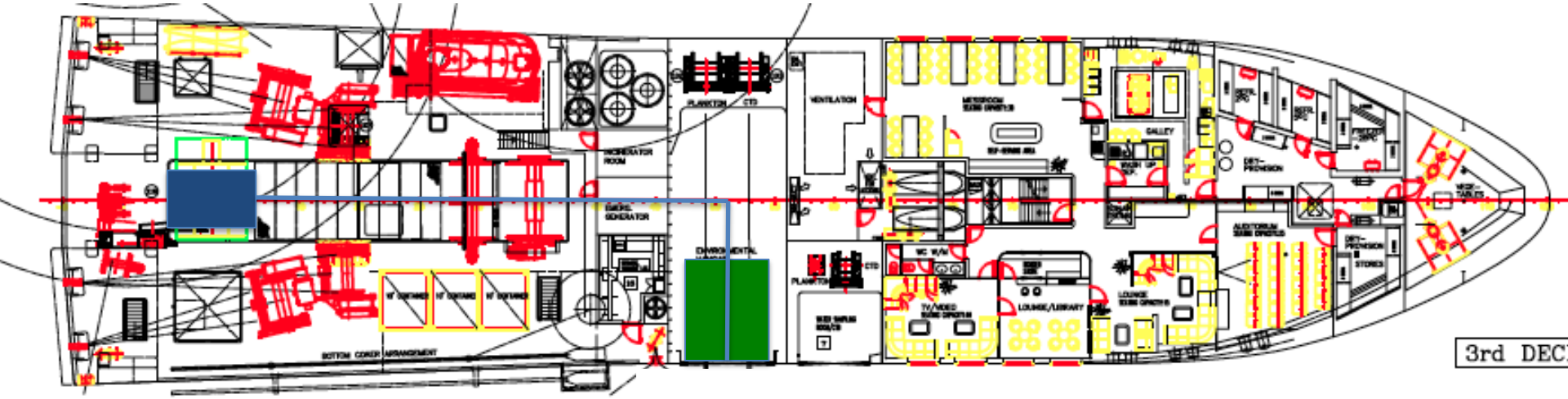
G.O. Sars

Kronprins Haakon

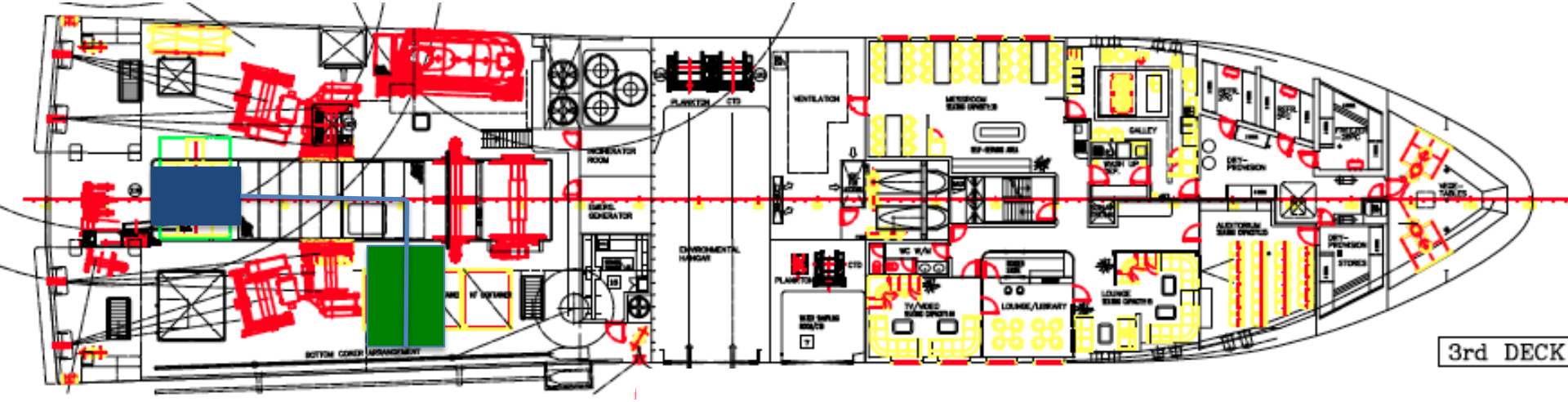
New Dr. Fridtjof Nansen

New LARS system in main hangar on "G.O. Sars"

LARS - Hangar



LARS - Deck

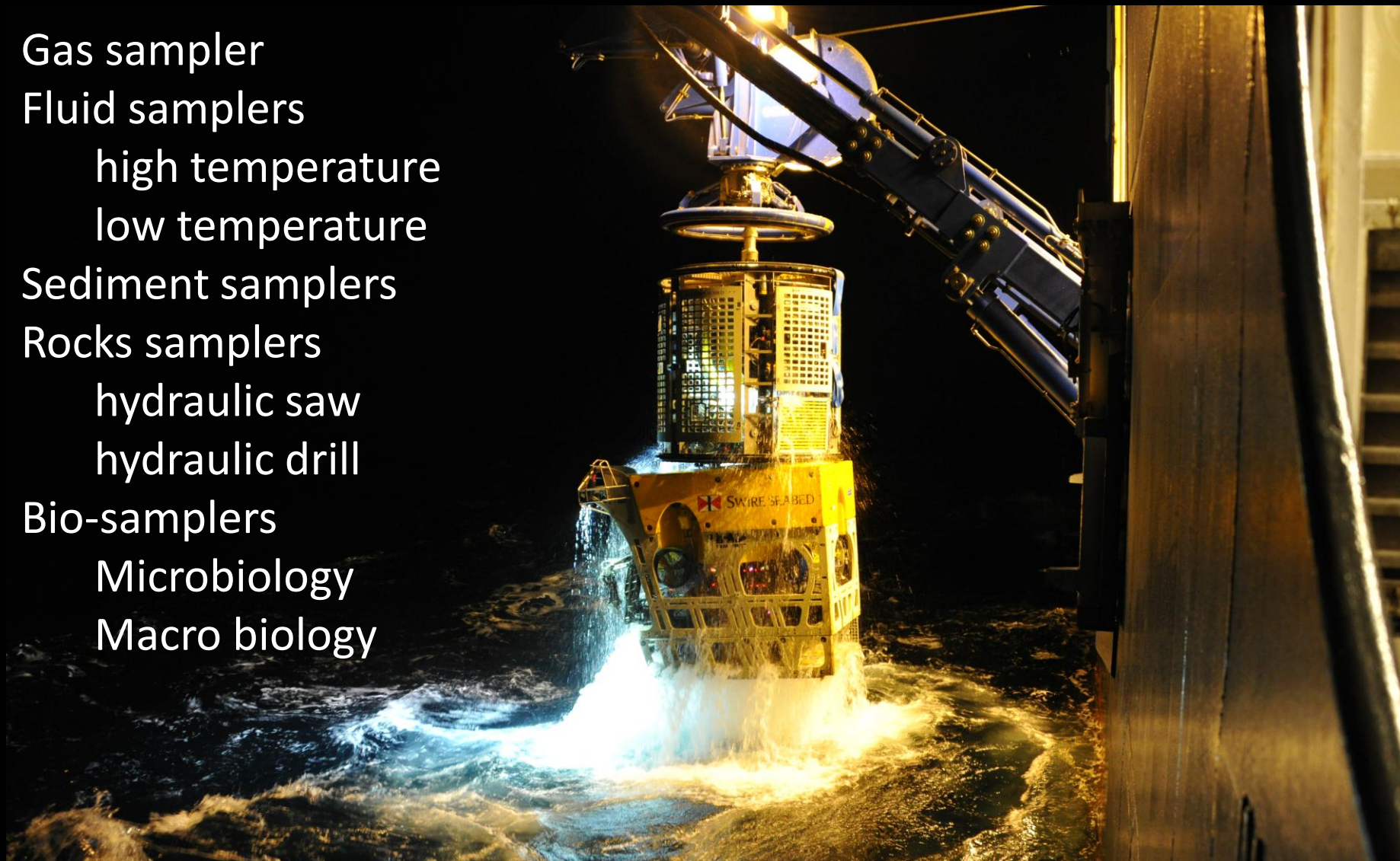


ROV – Scientific Payloads Samplers

Gas sampler
Fluid samplers
- high temperature
- low temperature

Sediment samplers
Rocks samplers
- hydraulic saw
- hydraulic drill

Bio-samplers
- Microbiology
- Macro biology



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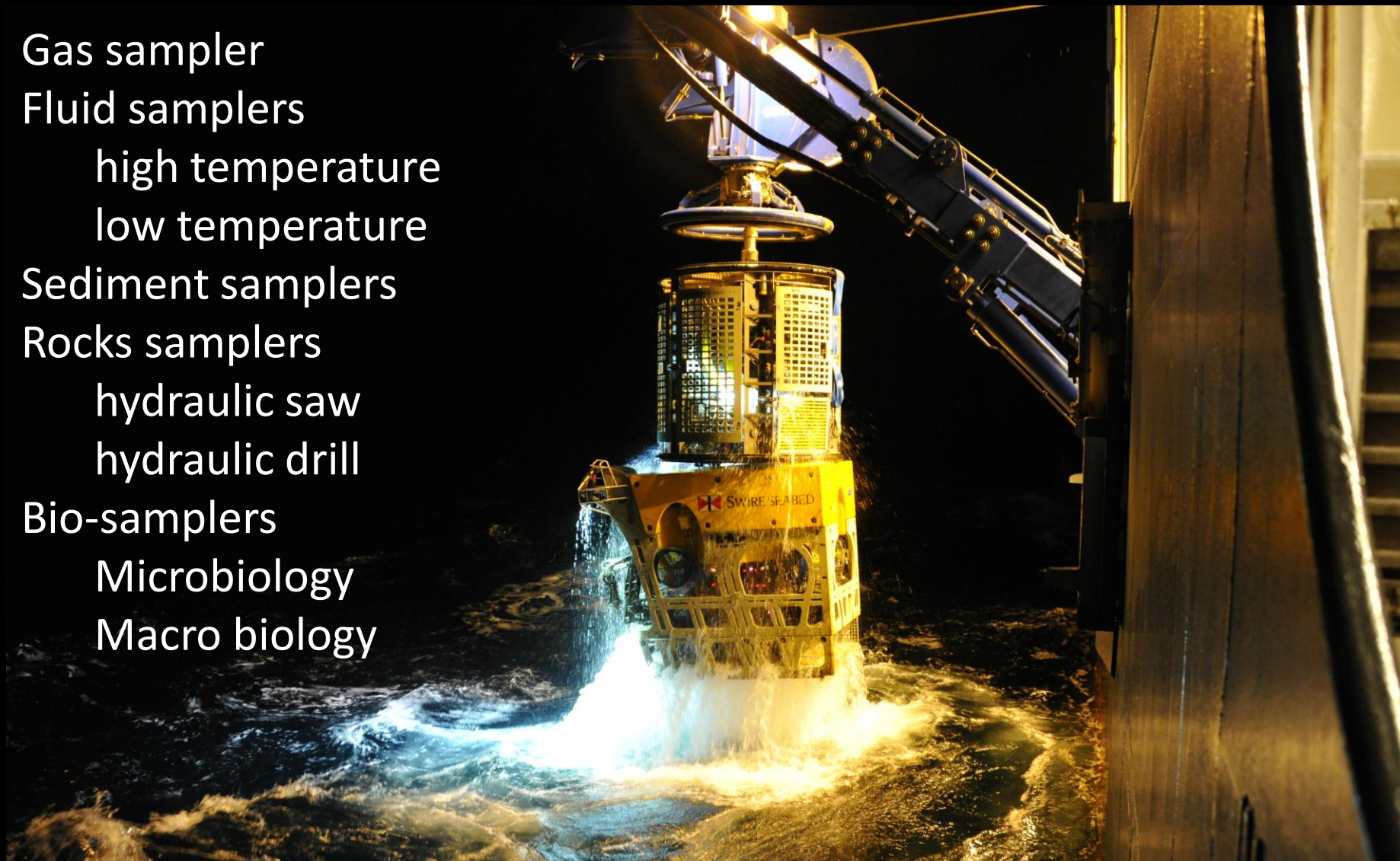
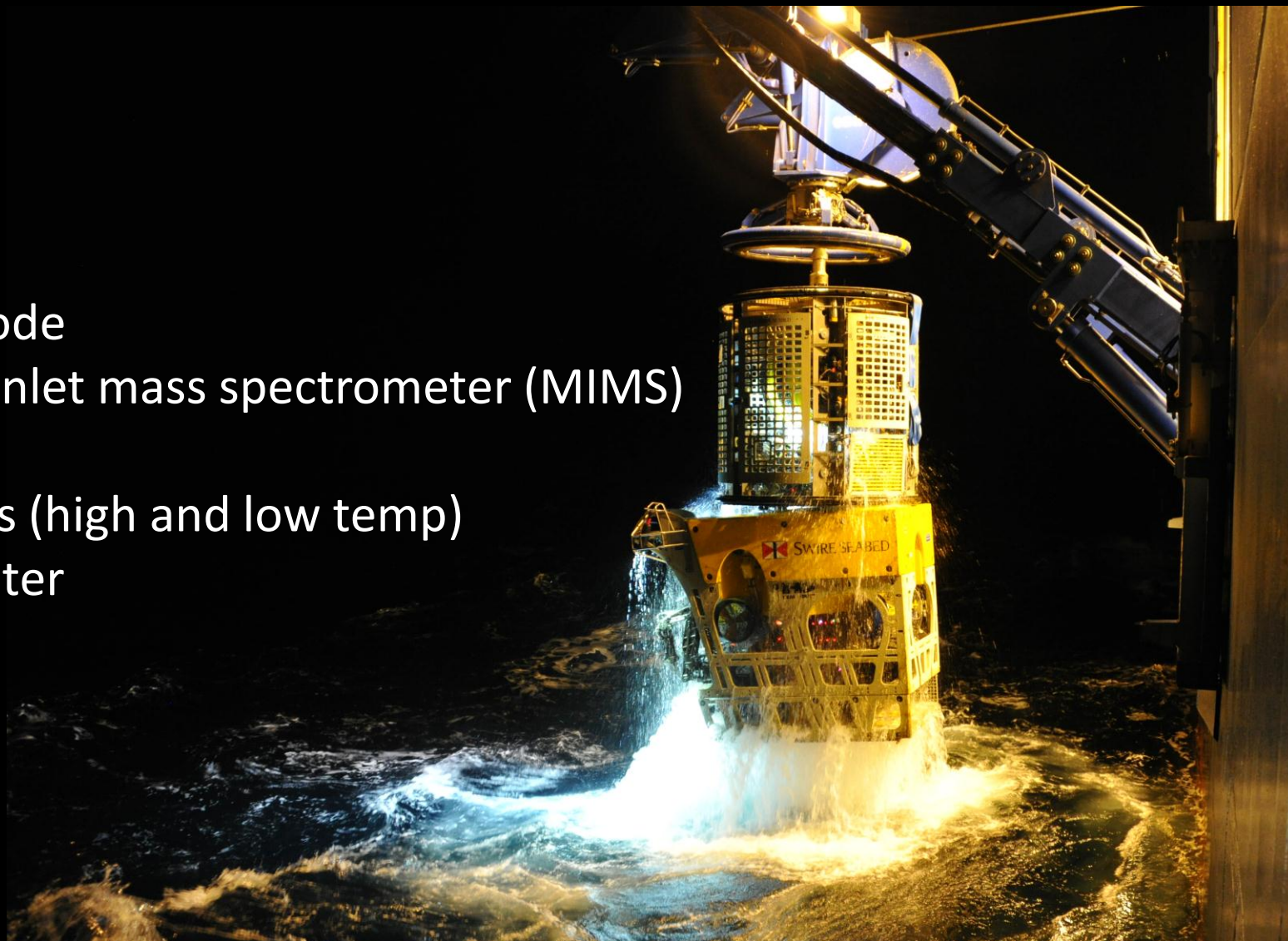


Scientific payloads:

Chemical and Physical Sensors

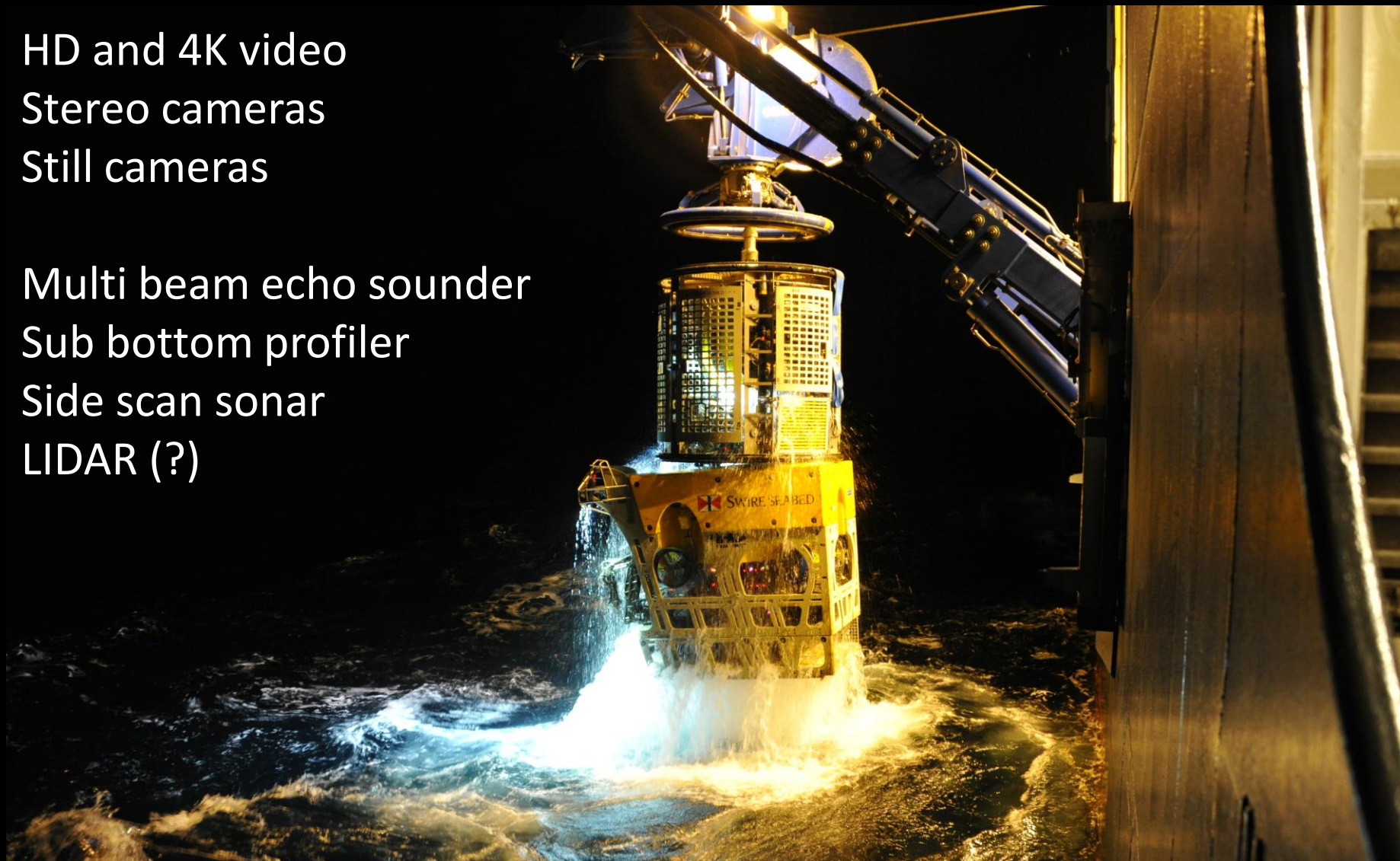
Eh sensor
CO2 sensor
CH4 sensor
Oxygen optode
Membrane inlet mass spectrometer (MIMS)
CTD
Temp probes (high and low temp)
Magnetometer



ROV – Scientific Payloads
Optical and Acoustic Imaging

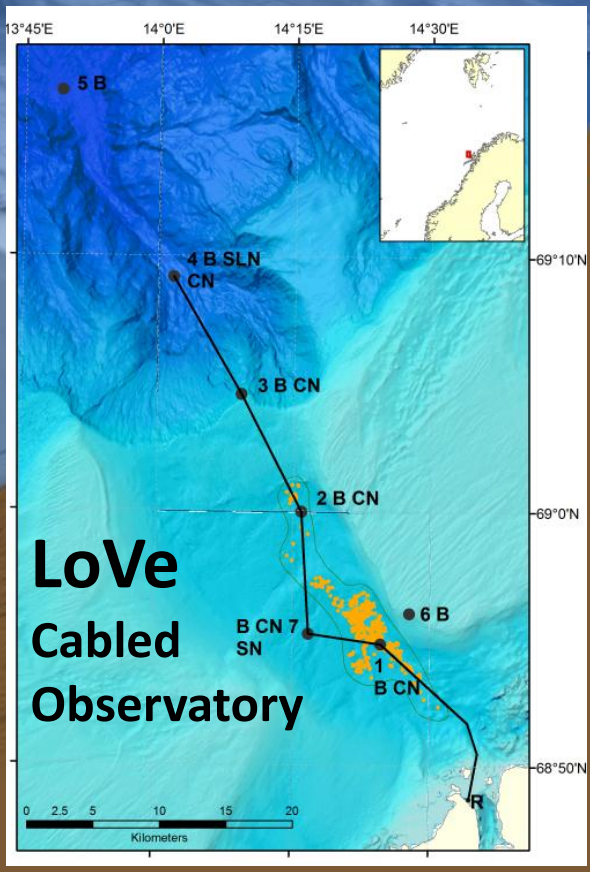
HD and 4K video
Stereo cameras
Still cameras

Multi beam echo sounder
Sub bottom profiler
Side scan sonar
LIDAR (?)



Scientific payloads:

Tooling and handling systems for Seafloor Observatories

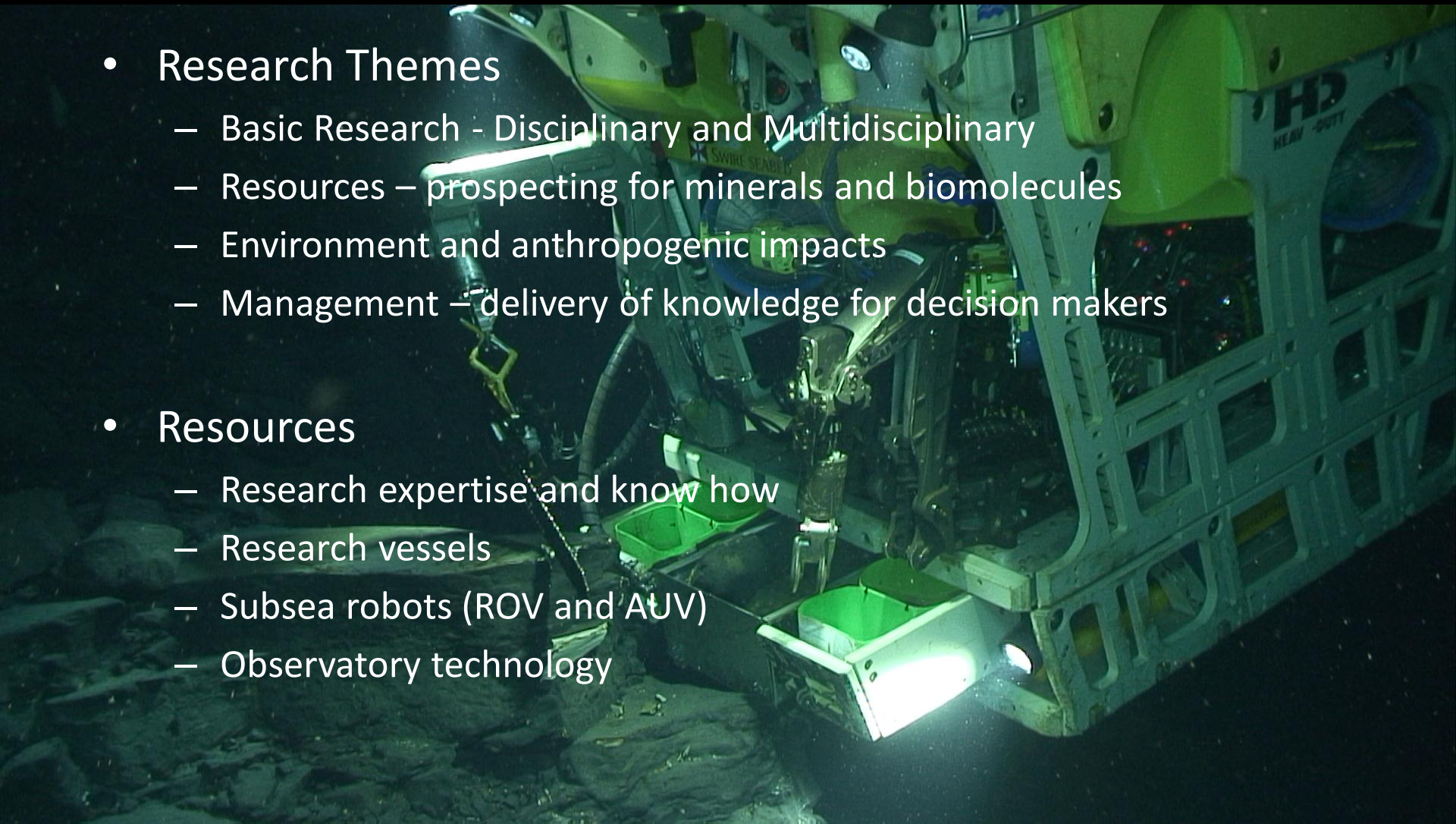


University of Washington

New Initiatives

Centre for Deep Sea Research

A National Centre and Facility for Deep Sea Research



- Research Themes
  - Basic Research - Disciplinary and Multidisciplinary
  - Resources – prospecting for minerals and biomolecules
  - Environment and anthropogenic impacts
  - Management – delivery of knowledge for decision makers
- Resources
  - Research expertise and know how
  - Research vessels
  - Subsea robots (ROV and AUV)
  - Observatory technology