

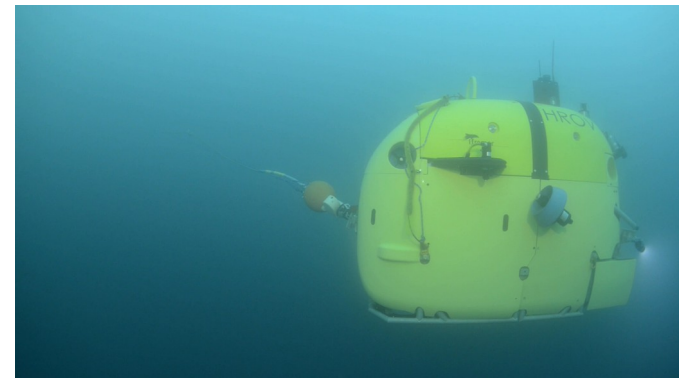
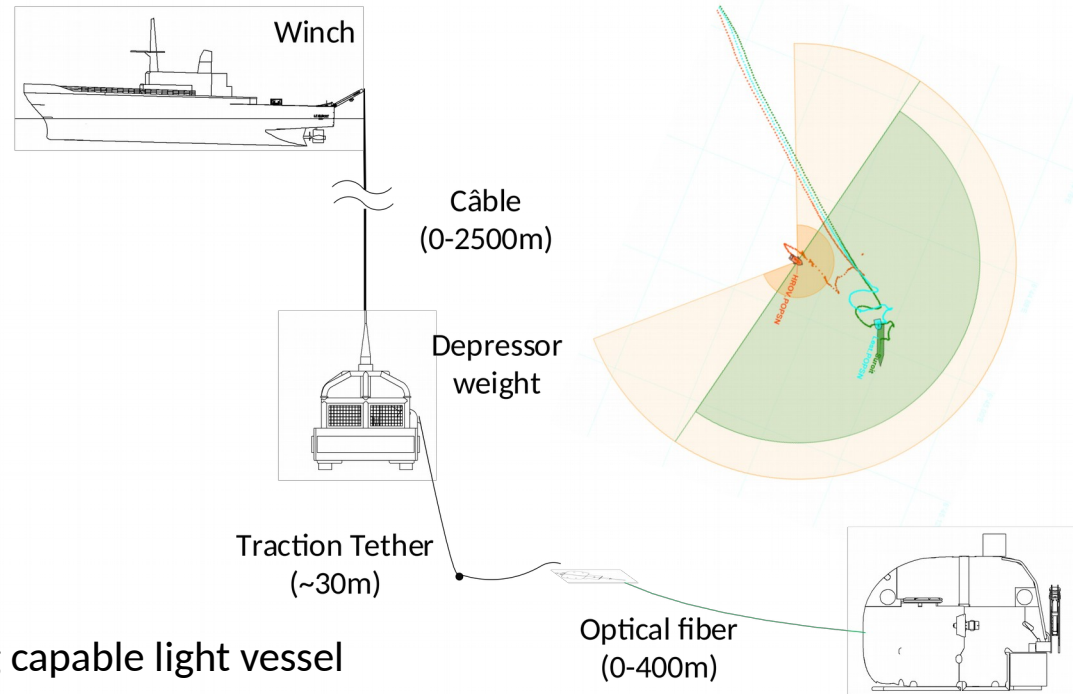
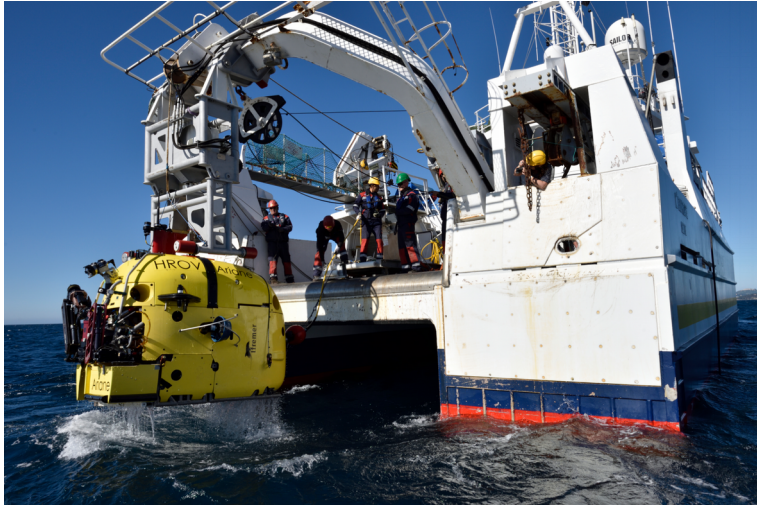


MOQESM'2018

DEMONSTRATION OF THE ARIANE
ABILITY
FOR ARCHEOLOGY OPERATIONS

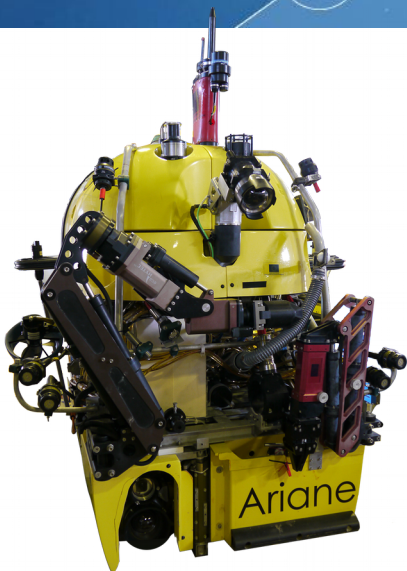
EWEN RAUGEL
IFREMER, UNDERWATER SYSTEM UNIT

Ariane, an innovative hybrid ROV



- ❖ Operation from a non Dynamic Positioning capable light vessel
 - ✓ Reduced operational cost
 - ✓ Easy and cost-effective access to ship time
 - ✓ Deployment from Coastal Vessel of the fleet (Europe, Côtes de la Manche, Antea...)
- ❖ Daily work cycle
- ❖ Perform tasks on all sorts of seabed morphology, emphasis on canyons, cliffs and steep inclines, up to 2500m depth

Ariane : general features



Weight	1,8 tons with payload ~220kg
Size	2800* 1850* 2130 mm ³
Depth	Deep water deployment up to 2500m Shallow water deployment up to 500m
Speed	0-2 knot
Autonomy	4 – 8h
Payload	Exploration configuration Cartography configuration

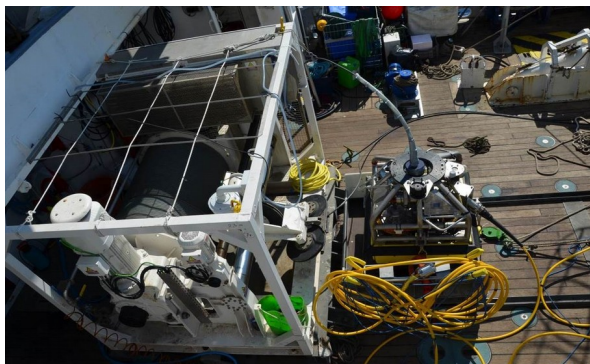
Equipments	
Sensors / navigation	Inertial unit(PHINS III) Depth sensor (Paro) vertical and frontal DVLs (600KHz) CTD (SBE49, Sea-Bird Electronics)
Positioning	GAPS / USBL-box
Communication	ROV : optical fiber AUV : acoustic modem
Imaging	Main Pan&tilt HD camera Scientific HD camera Integrated Digital still camera 3 auxiliary cameras (PAL) Scanning Sonar 360°/100m
Energy	13kWh@150V Li-ion battery + 6kWh@48V Li-ion battery
Safety devices	Drop weight (29.4 daN) Fiber cutter
Thrusters	Main propulsion : 2 tilting thrusters 2 vertical auxiliary thrusters 2 lateral auxiliary thrusters 18 liter reversible ballast

The various configurations of Ariane

Deployment

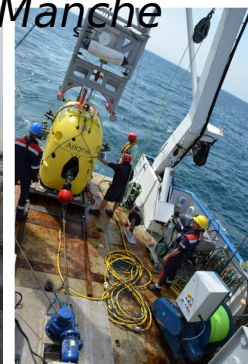
2500m depth deployment

N/O *L'Europe*, *Antea*...



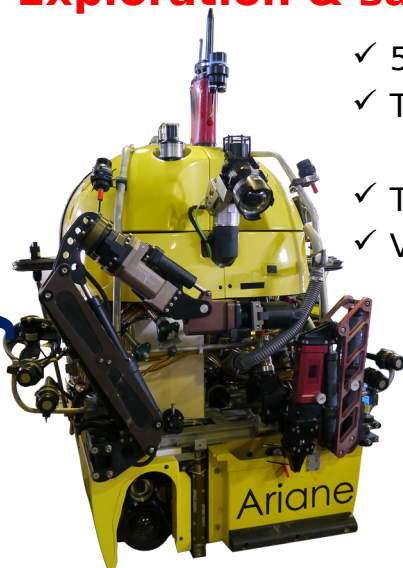
Shallow Water deployment (up to 500m)

N/O *Côtes de la Manche*



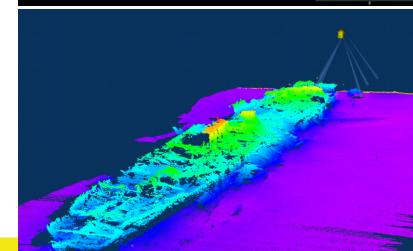
Exploration & sampling configuration

- ✓ 5 & 7 function electric arms
- ✓ Tilting digital still camera & HD camera
- ✓ Tools bay
- ✓ Various sampling devices



Cartography configuration

- ✓ Multibeam echosounder EM2040
- ✓ Tilting digital still camera & flash



Payloads

Archeology operation

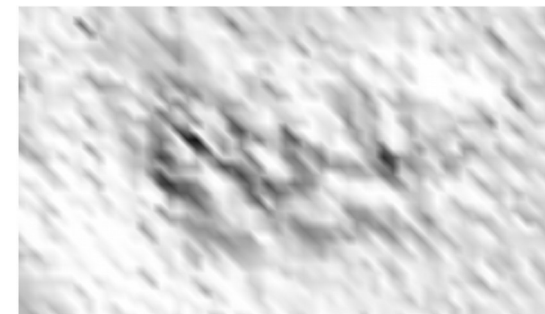
Example of archeology operation realized during the cruise CARTOHROV

- CARTOHROV : Technologic cruise for new payloads validation
- Date : November 2017
- Vessel : N/O L'Europe
- Zone : between Toulon and Saint Tropez
- Archeology operations in collaboration with DRASSM



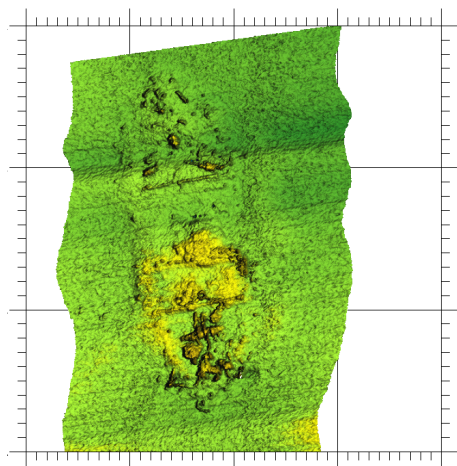
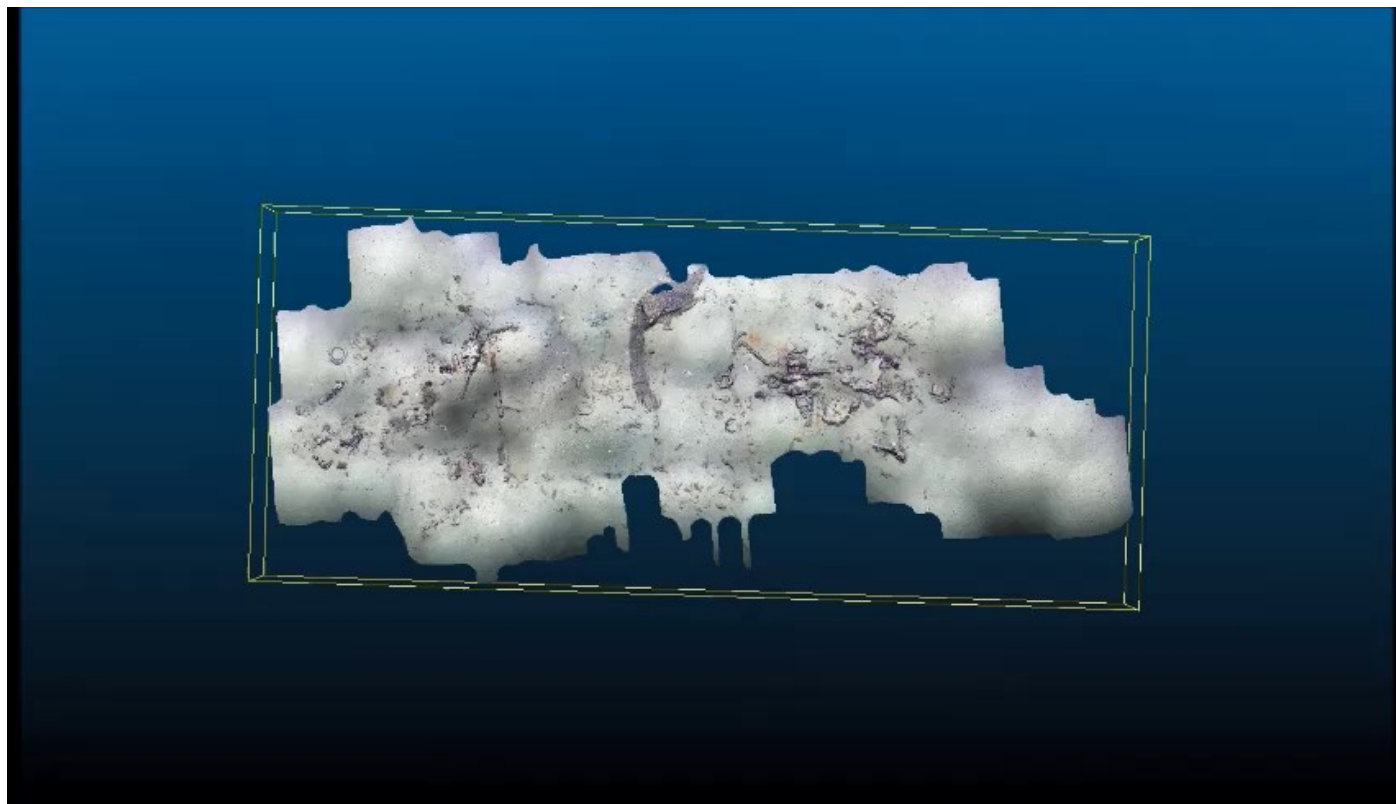
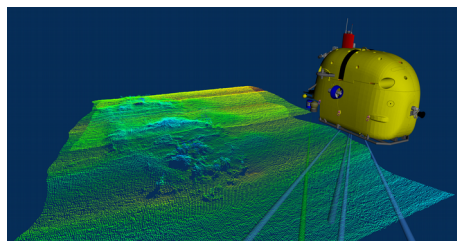
Archeology operation in cartography configuration

Shipwreck detection with multibeam echosounder during a survey
(altitude 40m)



Acoustic mapping of the
wreck (altitude: 5m)

Optical mapping of the wreck (altitude: 5m)



Archeology operation in explo. configuration

Two dives on a wreck near Toulon (Cavalaire 2)

→ First step : photogrammetry of the wreck (altitude : 3m)



Archeology operation in explo. configuration

✉ 2nd step : extraction of a pottery

HROV Ariane

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Campagne CARTOHROV

Plongée archéologique en collaboration avec le DRASSM
23 Novembre 2017

-

Récupération d'une poterie sur l'épave Cavalaire 2

Archeology operation in explo. configuration

✉ 3rd step : Excavation operation realized with a vacuum device

HROV Ariane

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Travaux de désensablement sur l'épave Cavalaire 2

Archeology operation in explo. configuration

✉ Last step : covering of the site with sand

HROV Ariane

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23 Novembre 2017

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Opération de ré-ensablage



Thanks for your attention