ESA UNCLASSIFIED – For ESA Official Use Only

ISD Workshop: Lunar Industrial opportunities

Sara Pastor

Day 2

12:00 - 12:50

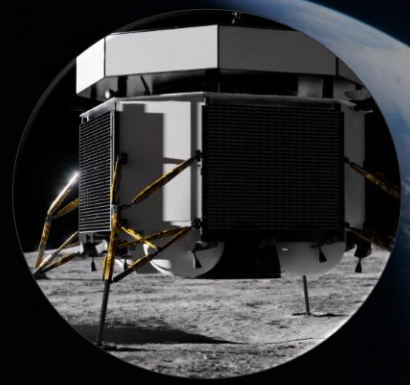
EUROPEAN SPACE AGENCY

Repositioning of European exploration

Stepwise own capability build-up to cope with investments

Maturing options on European self-determination in exploration for upcoming decision points, including IMM26 and CM28

- Moon Exploration Dual Strategy
- Build-up Autonomous European Robotic lunar exploration
- Continue cooperation on Moon Human Exploration, including incremental preparation for sustained human presence



Notional Timeline of potential ESA Exploration Lunar Missions

esa

ESA Relays Assets

Lunar Pathfinder

LunarLink →2037

Moonlight COM →2039

Moonlight NAV#1

Moonlight NAV#2,3,4

ESA Exploration Missions known and potential (incl. cooperation with IPs)

Argonaut-1

MRP

RSMA

Surface Mobility

Argonaut-2

OASIS/ECHO

Mobility vehicle

NOVAMOON build 3

Surface Mobility

Argonaut-3

TBD

Surface Mobility

MoonRad

VMMO or HRLMM

Luna Bridge (ESA/MBRSC/JAXA)

Small/Medium mission batch 2

LuSEE-Night (NASA)

Moonraker

MANI

LANS (JAXA)

Rashid-3 (MBRSC)

MoonFall (NASA)

NOVAMOON build 1

ESM Evo#1

ESM Evo#2

ESM Evo#3

ESM Evo#4

CLPS

ARTEMIS

NASA Moon Base

2027 2028 2029 2030 2031 2032 2033 2034 2035 2036

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Opportunites for Moon exploration (Approved Projects)

Argonaut:

- Argonaut Mission 1:
  - LDE-Mk1 consortium build-up (see next slide for details)
  - Payloads (RMSA and MRP) subject to October IPC. Potential opportunities at sub-contractor and equipment level will open afterwards
- Argonaut Mission 2: Study (ESA) ITT for mission and passenger definition to be released before end of Sept.

Lunar Communication System Study (HLCS Gateway repurposing):

- Study ITT closes on 18 Sept
- Implementation in Phase B2CDE1 to be decided by Member States at IMM26

Small Missions: two missions entering in Phase B2CDE1 in Mid/End 2027 – consortium will need to be build-up

Payloads (see next slide)

NOTE: OSIP call results for Lunar Science Building Blocks (Payloads) under evaluation

Opportunites for Moon exploration

Opportunities for Argonaut-1 LDE-Mk1 currently in ESA-Star:

26.THIT.007 — Issued

ARGONAUT LDE – Mechanical Ground Support Equipment [MGSE] and Transport Container

Argonaut LDE (previously named EL3, European Large Logistics Lander), is one of the keystones of the "Terrae Novae" exploration capabilities presented at Council Meeting 2022. Argonaut LDE aims at enabling a substantial and sustained European presence on the surface of the Moon ensuring Europe remains a key player in space exploration. Argonaut LDE aims at providing an autonomous European capability for regular large robotic surface missions for an extended duration. This provides the possibility to conduct independent missions if required as well as being a significant and visible contribution to the international sustainable exploration of the lunar surface. The mission is designed to support ...

Non ESA Tender Action
Open Competition
Announcement Date: 21/05/2026
Open Date: 07/08/2026
Closing Date: 30/09/2026

26.THIT.004 — Issued

ARGONAUT LDE – Thermal Control System (TCS) Assy

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Non ESA Tender Action
Open Competition
Announcement Date: 17/04/2026
Open Date: 17/07/2026
Closing Date: 11/09/2026

26.THIT.003 — Issued

ARGONAUT LDE – PNT Payload

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Non ESA Tender Action
Open Competition
Announcement Date: 17/04/2026
Open Date: 02/07/2026
Closing Date: 17/09/2026

26.0HBB.018 — Intended

ARGONAUT – E-Pump Switch Box (ESB)

This ITT is a re-issue of ITT 25.0HBB.004, for which there was no selection. For this re-issue of the ITT, specification requirements have been updated. OHB System AG, a subsidiary of the European space and technology group OHB SE, is acting as subcontractor to Thales Alenia Space (TAS-I) who has been contracted by the European Space Agency (ESA) as prime Contractor for the realization of the ARGONAUT Lunar Descent Element (LDE). Under its subcontract, OHB is responsible for the EPS, TT&C and GNC subsystems up to flight readiness. The objective of the present procurement is the selection of the subcontractor for the 3 x Argonaut E-pump Switch Box (ESB). As part of the Argonaut LDE ...

Non ESA Tender Action
Open Competition
Announcement Date: 13/08/2026

1-13637 — Intended

ARGONAUT 2 MISSION - PHASE A/B1

Mission Prime activities for Phases A/B1 of Argonaut Mission 2 cover the system-level studies and engineering activities required to support future mission implementation, including the definition and assessment of mission configurations based on different combinations of the following primary payloads: NovaMoon payload (Build 3); Scientific package composed of OASIS and ECHO; ScientificMobility Asset.

ESA Tender Action
Open Competition
Announcement Date: 22/07/2026

26.0HBB.017 — Intended

ARGONAUT – S-Band Medium Gain Antenna Assembly (S-MGAA)

OHB System AG, a subsidiary of the European space and technology group OHB SE, is acting as subcontractor to Thales Alenia Space (TAS-I) who has been contracted by the European Space Agency (ESA) as prime Contractor for the realization of the ARGONAUT mission. Under its subcontract, OHB is responsible for the EPS, TT&C and GNC subsystems up to flight readiness. The objective of the present procurement is the selection of the subcontractor for the Argonaut LDE S-Band Medium Gain Antenna Assembly (S-MGAA). As part of the TT&C subsystem, the S-MGAA is responsible to provide a directional S-band communication link with the relay satellite enabling the LDE to transmit telemetry, video, ...

Non ESA Tender Action
Open Competition
Announcement Date: 08/07/2026

25.THIT.031 — Intended

ARGONAUT LDE – Life Cycle Analysis [LCA]

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Non ESA Tender Action
Open Competition
Announcement Date: 11/08/2025

Remaining opportunities for Argonaut-1 LDE-Mk1

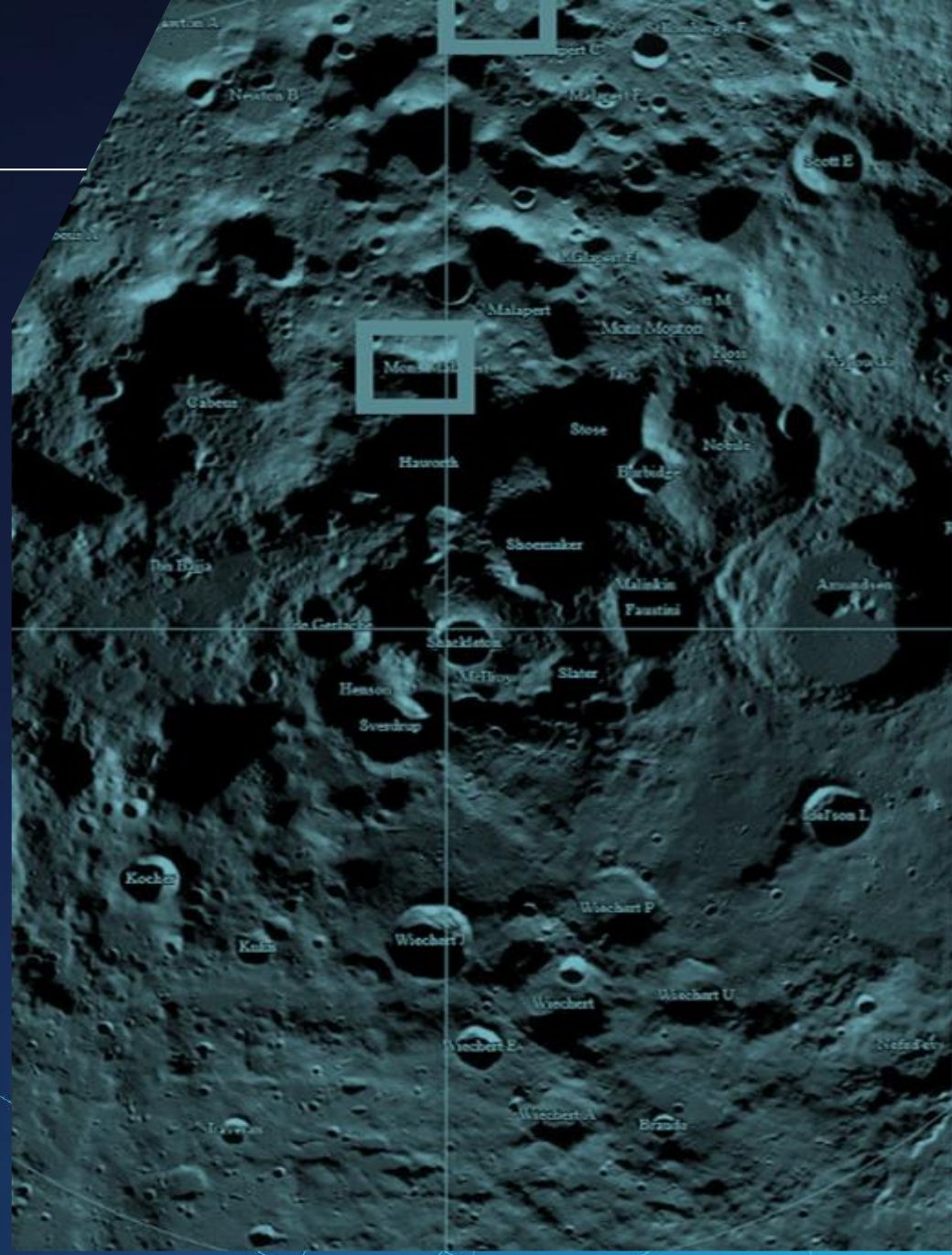
Procuring Entity	Subject of Procurement
TAS-I	ISVV
TAS-I	SCOE Simulator
TAS-I	Life Cycle Analysis
TAS-I	AIT Support Activity
TAS-I	CAD & Drawings
TAS-I	Mechanical Analysis
TAS-I	GNC Field test
TAS-I	Lander Mock-up (Astronaut Trainning & PR models)
TAS-I	Environmental Test Campaign
OHB	ESB (Electrical Switch box)
OHB	S-Band Medium Gain Antenna Assembly (S-MGAA)

SCOE: Special Check Out Equipment

ISVV: Independent Software Verification and Validation

Science, instruments and payload development opportunities around and on the Moon

- Environment Characterisation and Heliophysics Outpost (**ECHO**)
- Power and comms package to survive lunar night (**OASIS**)
- Commercial Lunar Data Products for Exploration Science
- Small Missions (aka Moon Explore) scientific content



Focus Moon: Small Missions (aka Moon Explore) to the Moon

- Initiative launched in 2023
- Aimed at becoming a recurrent **programmatic segment**, addressing all destinations
- Starting with a Pilot mission (MAGPIE)

Objectives:

- Shorter cycle missions – targeted 4.5 years (Phase A to launch)
- 50-80 M€ targeted cost
- Can provide exploration and/or scientific content --> initial missions with key role for lunar environment characterisation/mapping

Within Explore 2040 context, programmatic opportunities for:

- Preparing and supporting longer-term elements of the programme
- Increased non-dependence missions
- E3P **small to medium contributing States**

Opportunites for Moon exploration (Programme re-orientation, subject to IMM26 & affordability)

- Activities to be proposed as part of the Programme re-orientation (IMM-26):
  - ESM evolutions / transportation solutions
  - Luna Bridge (ESA/JAXA mission)
  - Argonaut-2 acceleration
  - Lunar Communication and Navigation (together with RNC directorate)
  - Additional Small Mission

- Activities as part of preparation to CM28:
  - Robotic missions studies to prepare for implementation after CM28 – refer to EXPERT/Future preparation presentation

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THANK YOU!