ROLE OF THE MOON IN
ESA’S SPACE EXPLORATION STRATEGY

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NASA Community Workshop on the GER
Washington D.C., 10 – 11 April 2014
John’s Hopkins Applied Physics Laboratory Kossiakoff
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### VISION

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### STRATEGIC GOALS

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### ENABLERS

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### DESTINATIONS

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### ROLE OF ESA

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ROLE OF THE MOON

- Accessibility
- Resources
- Science
- Stepping Stone
  - Partnership
  - Risks mitigation
  - Technology
• Secure role on critical path in international human exploration architecture
  ✓ Cooperation with NASA on MPCV
• Acquire access to lunar surface
  ✓ Cooperation with Roscosmos on Luna 27 lunar lander (LunaResurs1)
• Advance human-robotic partnership in space
  ✓ ISS as test-bed for advancing technologies for in space tele-operation of robotic elements (METERON)
ESA MISSION SCENARIO
WITHIN INTERNATIONAL CONTEXT

2015

- International Space Station
- Opportunity for Utilisation of Commercial or Government-Owned Platforms

2020

- Lunar Resurs
- LPSR
- Opportunity for Participation in Human-assisted SR
- Opportunity for Participation in Human Missions

- Cis-Lunar Staging Post
- Communication link
- Staging

- Environmental Knowledge Gain
- Technology Advancement
- Human Health & Performance Risks
- Capability Evolution

- Lunar Missions
- Post-ExoMars Mission
- Opportunity for Participation in MSR Mission
- Opportunity for Participation in Human Mission

- Transportation
- Orion
- SLS
- SLS Upgrade
- ExoMars’16
- ExoMars18
ROLE OF ESA
STRATEGIC BUILDING BLOCK ELEMENTS (EXAMPLES)

Building Blocks

Visual Navigation and Hazard Detection and Avoidance (VN&HDA)
Lunar Resurs/LPSR

Rendezvous with non-cooperative targets and docking systems
ISS /MPCV-ESM

Habitation Systems
ISS /MPCV-ESM

2015

International Space Station

2020

Lunar Resurs
HALSR Mission
Post-ExoMars: MPL

Human Lunar Surface Missions: HRLL

Post-ISS LEO Station
ISS Extension
Evolvable Cis-Lunar Deep Space Habitat / Tug
HALSR Mission
Post-ExoMars: Phobos SR

Human Lunar Surface Missions: HRLL

MSR Mission

2035

International Space Station

ACLS

Evolvable Cis-Lunar Deep Space Habitat
Human Lunar Surface Missions: HRLL

ISS Extension
Post-ISS LEO Station (China)

ISS Extension
Post-ISS LEO Station

ACLS

ESA UNCLASSIFIED – For Official Use
Towards International Cooperation

I. Promote multi-lateral cooperation framework for lunar exploration exploiting common interests

- Exploit potential of early human missions to lunar vicinity for advancing lunar exploration goals
  - Innovative mission scenarios
- Establish international staging post in lunar vicinity with redundant access for crew and cargo
  - Innovative mission scenarios
  - Robustness
  - International cooperation and private sector services
  - Deep space exploration preparation
- Build international human-rated lunar lander
  - Re-usability
THANK YOU!