

**space for  
inspiration**



ESA ESTEC  
12-13 July  
**2022**



## SSTL-ESA commercial partnership / Lunar Pathfinder

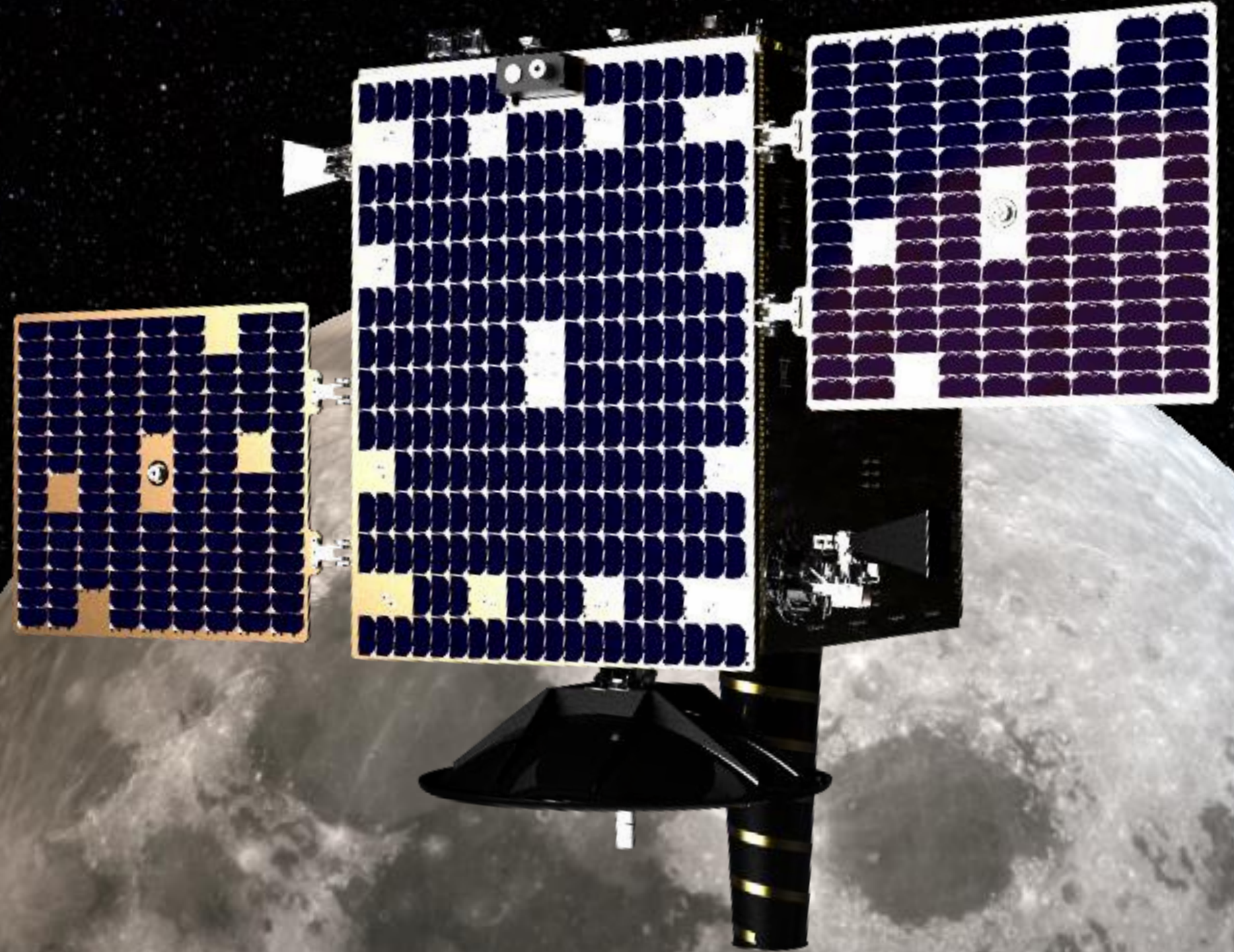
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ESA Space for Inspiration, 12-13 July 2022, ESTEC



# Lunar Pathfinder is an early demonstration of how ESA and Industry can work together to open new markets



Lunar Pathfinder will be launched in 2025, as a result of a successful partnership between ESA and UK company SSTL





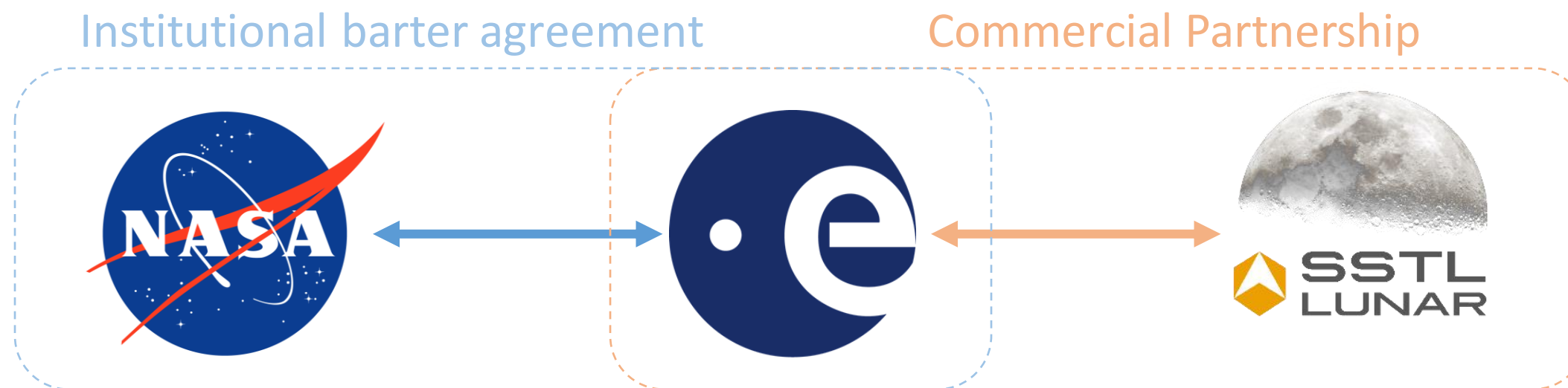
Collaborative work between ESA and SSTL, supported by UKSA, started more than 6 years ago...



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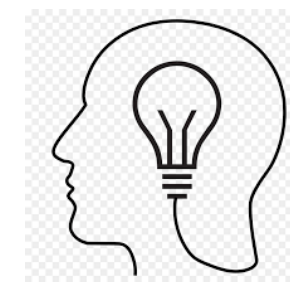
- A story of **tenacity** → over 6 years iterating on (difficult) concept and business case
- A story of **trust**
  - Between ESA and industry → ESA anchor customer of system built and owned by industry
  - Between ESA and NASA → barter agreement between the 2 agency, key enabler to the mission
- A story of **entrepreneurship**
  - About having a business plan for sustainable commercialisation in space
  - About sharing market risks to enable SSTL to take a certain level of risk in setting up the business

# Before we get to the WHAT, the WHO and HOW play a fundamental role in this success story



How it works

- ESA and SSTL are in Commercial Partnership by which:
  - SSTL designs, builds, owns and operates the Lunar comms (Pathfinder) services on a commercial basis. SSTL is responsible for the business development and commercialisation
  - ESA is the anchor customer for the Lunar comms services
  - ESA also supports key technology development for the lunar link payload, through the GSTP programme
- ESA and NASA have signed a barter agreement by which:
  - NASA provides the launch and delivery into operational orbit for Lunar Pathfinder (via CLPS providers)
  - ESA provides to NASA a package of Lunar comms services using Lunar Pathfinder



Why it is genius!

- Barter and GSTP contribution lower CAPEX
- Anchor customer provides guaranteed min revenues and early cash flow
- ESA and NASA as early users of the services help industry to provide the right service

→ Industry share-holder have the confidence to invest in the business case!





Lunar Pathfinder offers data-relay services, which complement the developing offering of DTE  
→ KSAT and SSTL are working on combining our offering of DTE and DATA-RELAY, for a seamless, continuous comms services.

#### Data-relay for all lunar missions

- **ANY LOCATION** (far-side, polar, near-side, orbital)
- **ANY TYPE** (surface, static, orbiting)

#### Enabler for exploration and science missions

- Enables far-side missions with shared infrastructure on usage fee
- Gives autonomy to surface missions (direct comms to orbit / no line of sight constraint)
- Is cheaper for most missions : lighter, cheaper user terminal for better data-rate, increased payload capacity



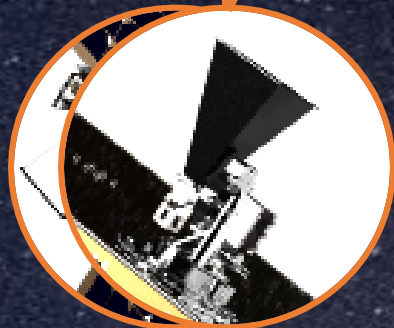


# Lunar Pathfinder Capabilities

User return data-rates:

- **Earth Link**
  - 5Mbps X-band
- **Moon Link\***
  - 8Mbps S-band
  - 4Mbps UHF

\*depending on location and user performance



X-Band Earth Link



S-Band Moon Link



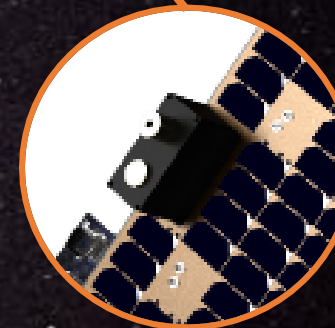
UHF Moon Link



Laser Retro Reflector



GNSS Weak Signal Detection



Radiation Monitor

Communications

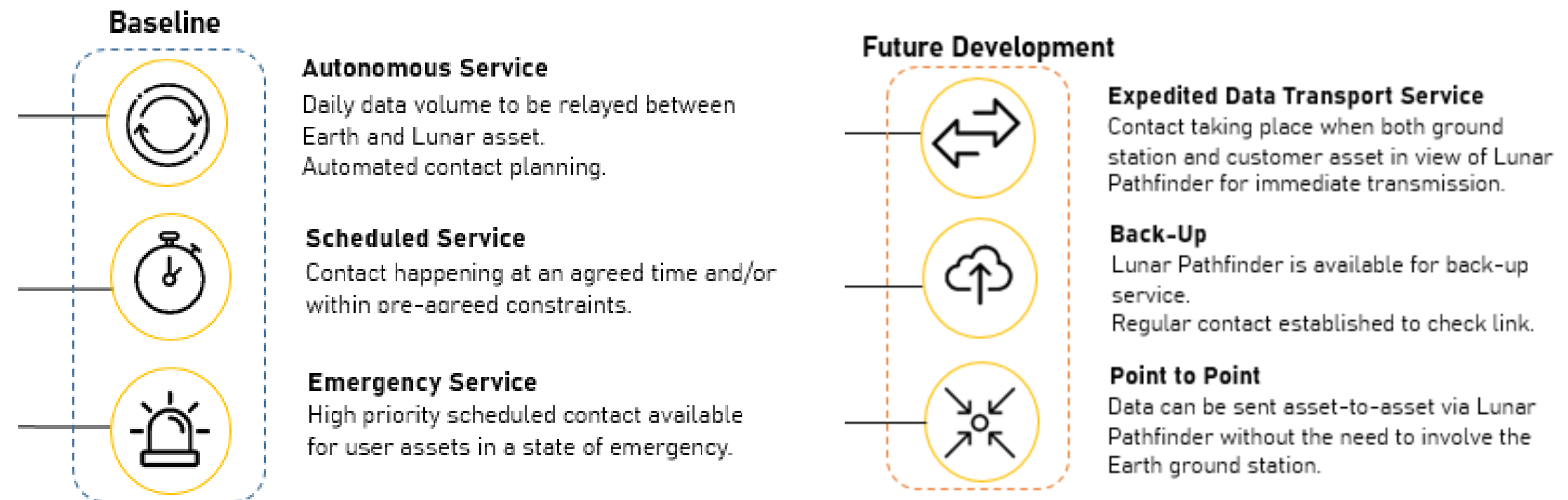
Hosted Payloads



# A shared infrastructure to provide for essential needs: communicate, locate, interact, rescue...



- Lunar Pathfinder is altogether a proof of concept, a demonstrator and a commercial service in its own rights
- It is the first node of the future ESA Moonlight constellation, and paves the way for its market uptake
- Lunar Pathfinder offering:



Both Service guide and Mission builder tool are available on <https://www.sstl.co.uk/what-we-do/lunar-mission-services>

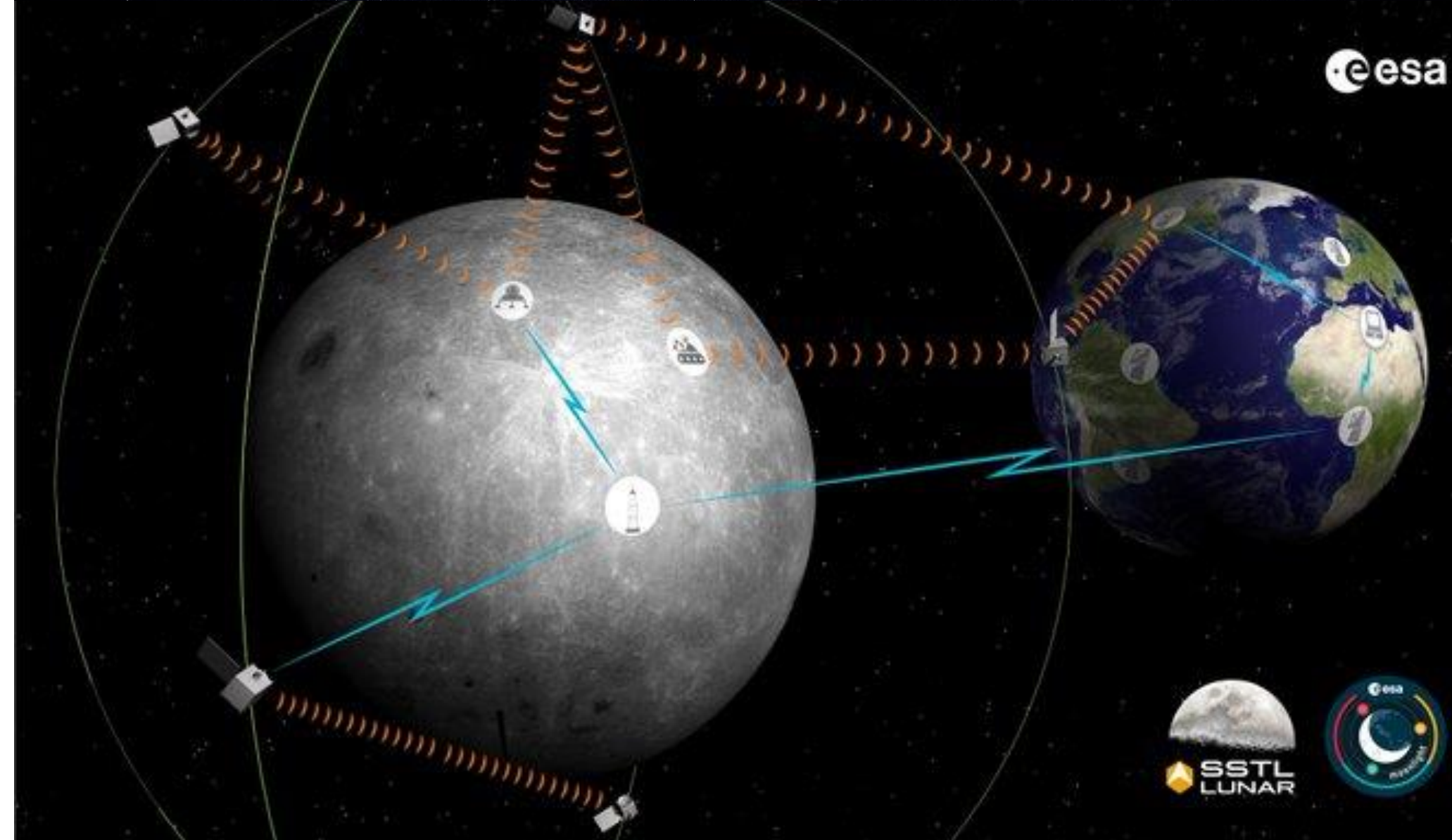




- With Lunar Pathfinder, ESA, industry, the member states, other institutions, other industry are finding a way to work together...
- ... to enable space exploration to become something different...
- ... a commercial endeavour accessible to all sorts of industrial players...
- ... willing to embark on a story of tenacity, trust and entrepreneurship.

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# ~~Conclusion~~ To be continued...



<https://www.sstl.co.uk/what-we-do/lunar-mission-services>

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*Thank you for your attention*



SSTL  
LUNAR