



argotec[®]

***Exploring the Solar System with Cubesats:
New Missions from Argotec***

*Lorenzo Provinciali
Systems Engineering Unit*

Argotec S.r.l.

Via Cervino 52
Torino, Italy

Argotec Inc.

1801 McCormick Drive
Largo, Maryland

Argotec Small Satellites



Argotec designs and manufactures high-reliable rad-hard small satellite platforms able to **operate in different environments, from deep space to LEO**

The company developed a proprietary scalable satellite platform (from 6U up to 27U) called **HAWK**

In 2022, Argotec became the only company in the world to have performed **two small satellites missions in deep space**



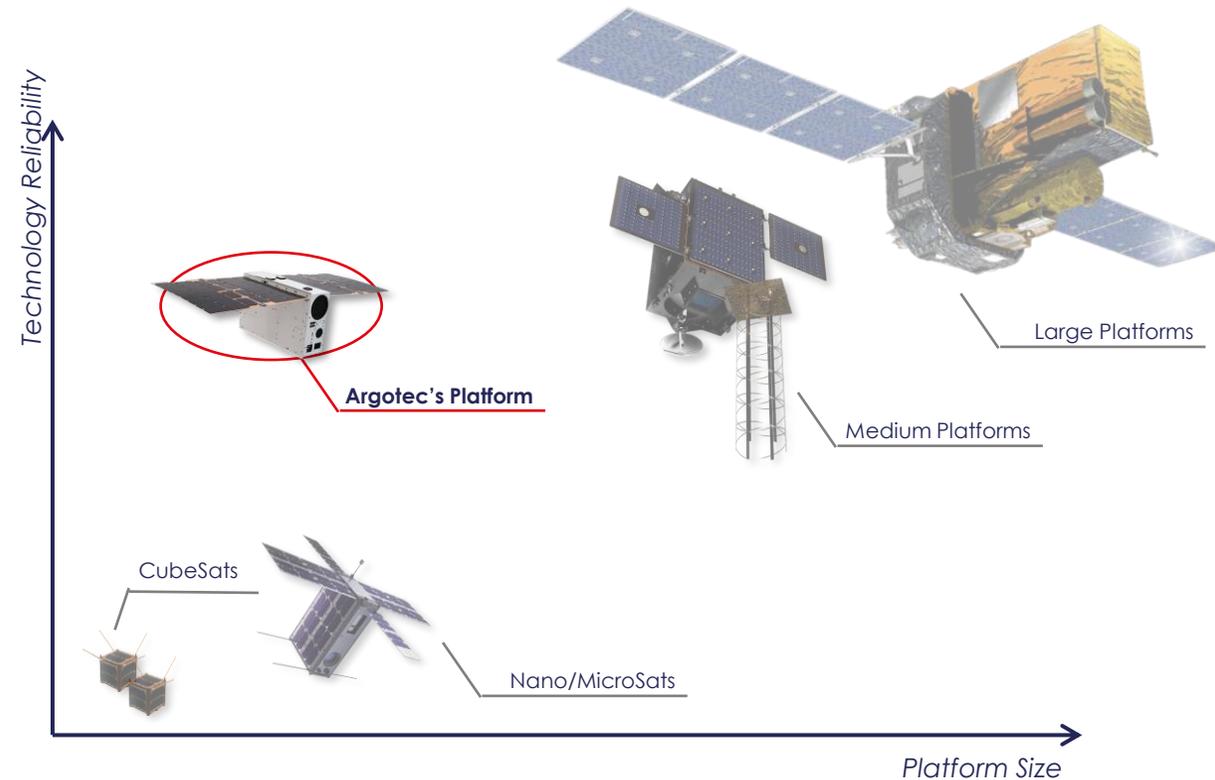
LICIACube
(DART)



ArgoMoon
(Artemis I)

The deep space missions are being operated from the company's Mission Control Center, the first European private control center to be **certified by NASA JPL** and **directly connected with NASA DSN and ASINet**

The **low platform cost** and **short development time** allow us to gain strategic advantages in terms of **fast time to market** and **high ROI**





HAWK in Deep Space

What's next:

LUMIO and HENON



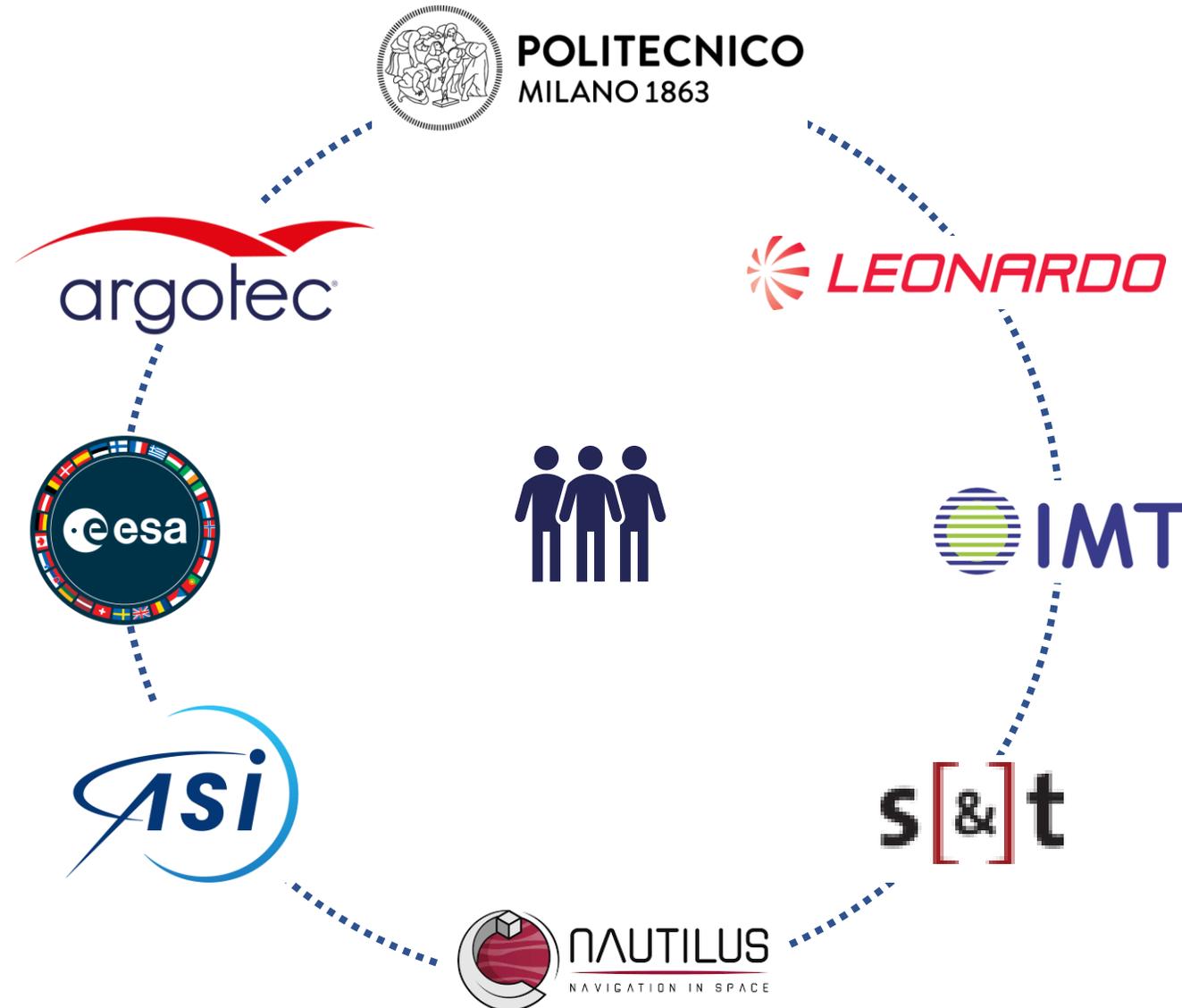
LUnar Meteoroid Impacts Observer

Main objective: Observation of meteoroids impacts on the dark side of the Moon to complement Earth-based observations. Useful to refine models of lunar meteoroid environment and inform future lunar exploration missions.

Secondary objective: autonomous orbit determination based on optical observations of the Moon disk.



LUMIO Team



LUMIO Mission Profile

- **WSB** transfer: ~ 120 days, up to 1.5 Million km away from Earth
- Up to 5 **Deep Space Maneuvers**
- **1-year** operative orbit:
Earth-Moon L2 HALO
- About **25 HALO orbits performed**
- EOL: **crash on the Moon**

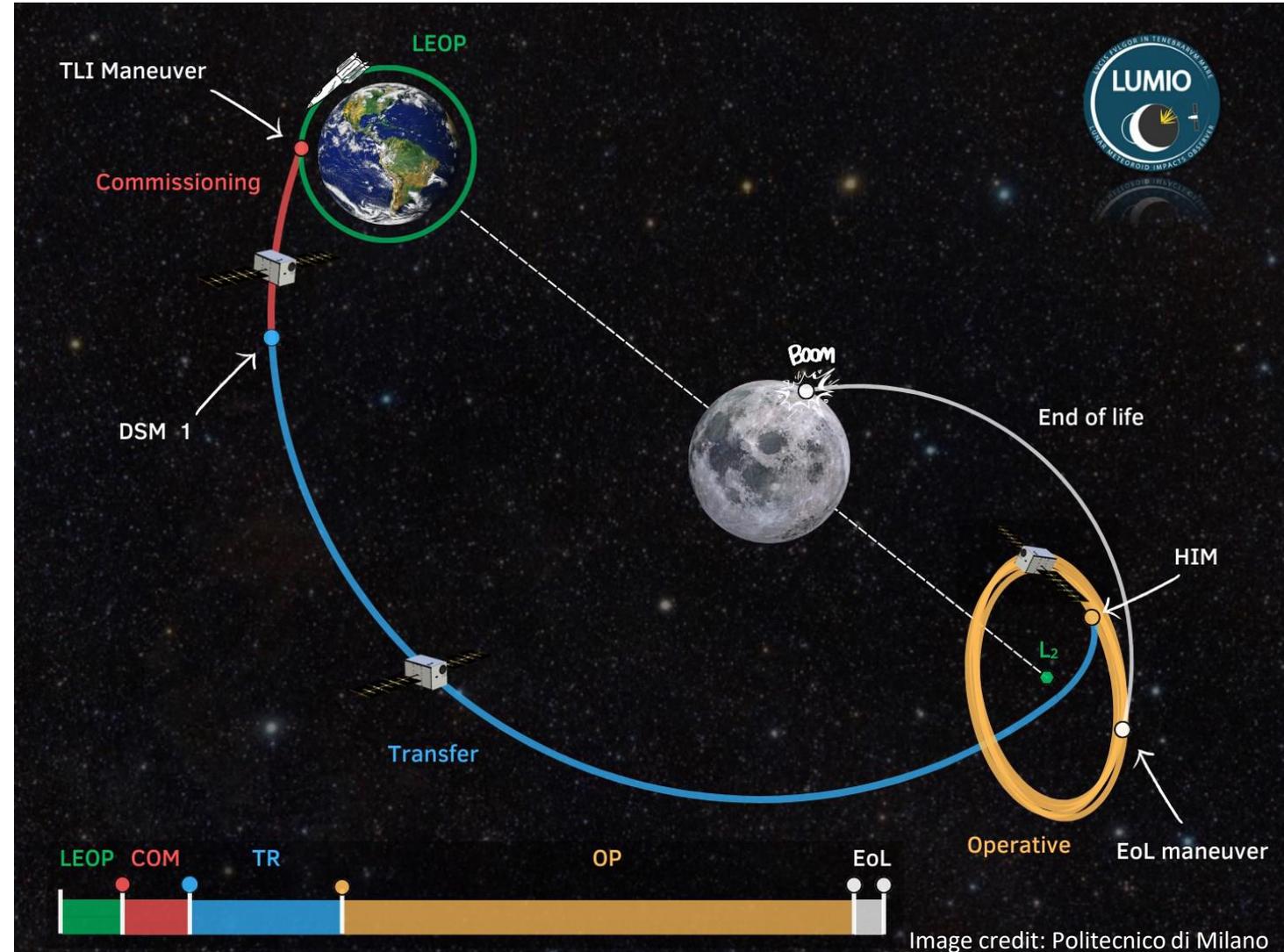


Image credit: Politecnico di Milano

LUMIO - Operations

- **Optical** instrument in **Visible** and **NearIR** spectrum
- **On-board processing** of pictures to detect **flashes** due to **meteoroid impacts** on the dark side of the Moon
- ~ **14 days of observations** per HALO (Science cycle)
- ~ **14 days** per HALO for **data downlink, SK maneuvers and moon-based navigation experiment** (Nav & Eng cycle)

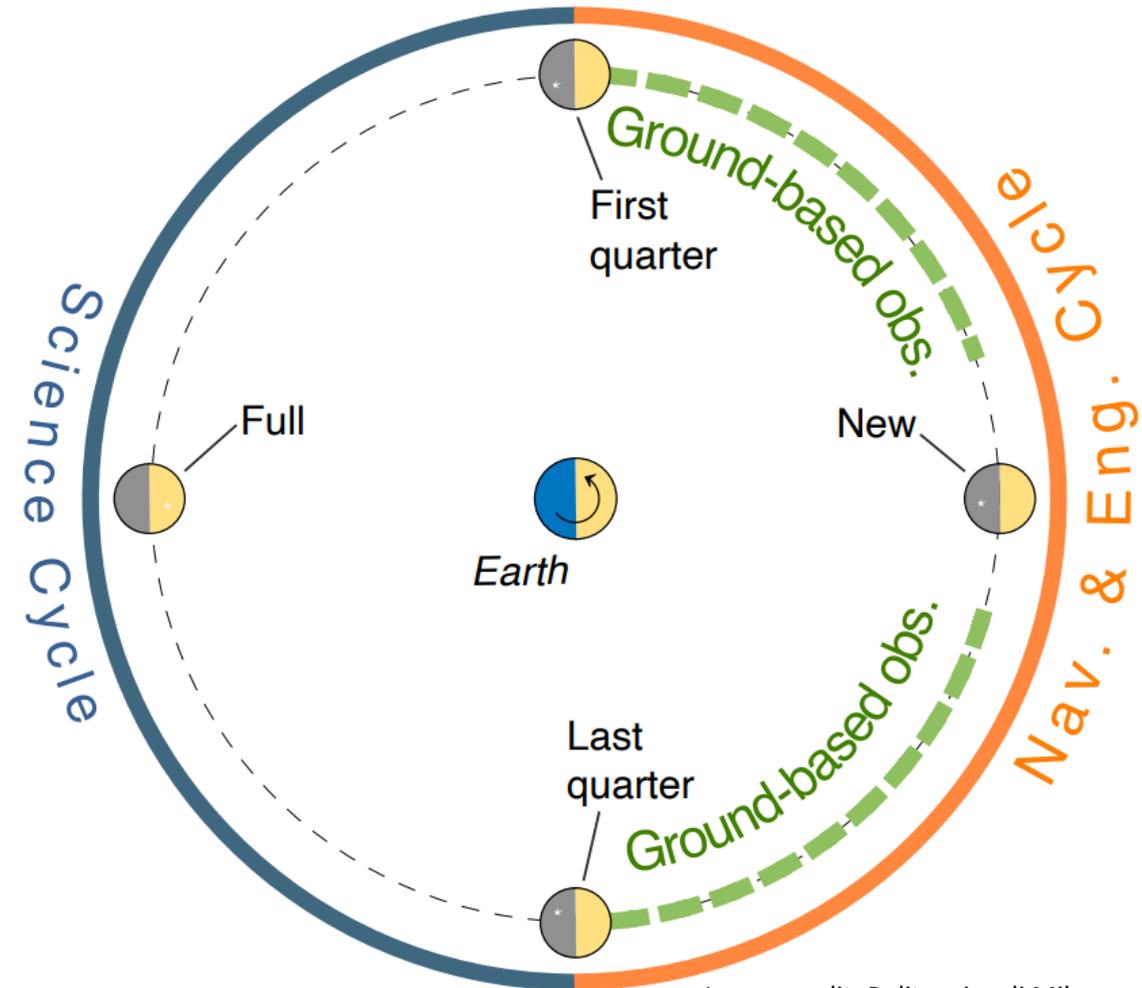
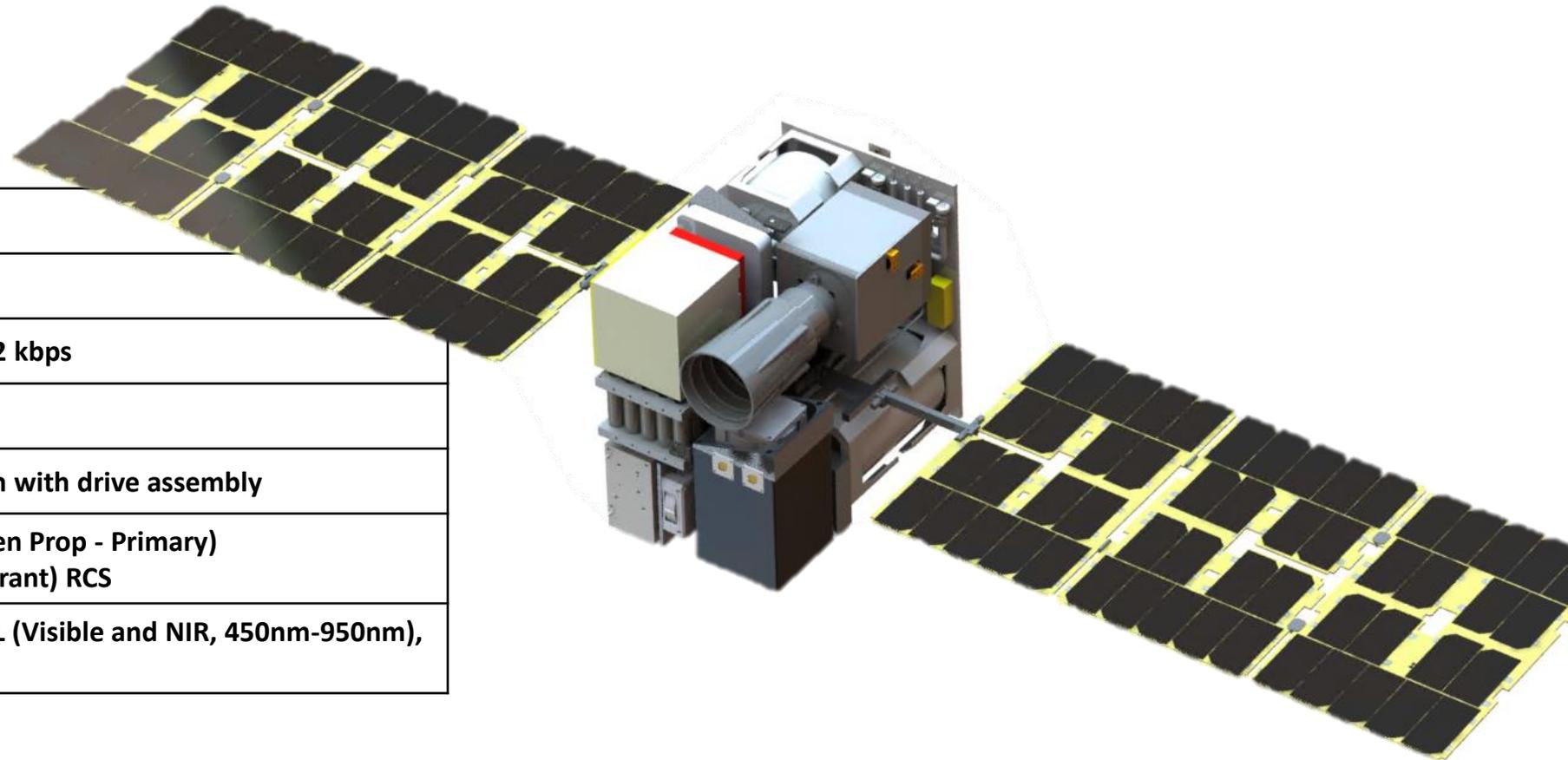


Image credit: Politecnico di Milano

LUMIO - Overview

| | |
|----------------------|--|
| Mass | 28 kg |
| Volume | 12U |
| Downlink Band | X-Band up to 512 kbps |
| Lifetime | >1,5 years |
| Solar Arrays | 120W generation with drive assembly |
| Propulsion | ADN based (Green Prop - Primary) Cold Gas (refrigerant) RCS |
| Payload | 6° FoV Optical PL (Visible and NIR, 450nm-950nm), 15fps |



HENON

HEliospheric pioNEer for sOLar and interplanetary threats defeNce

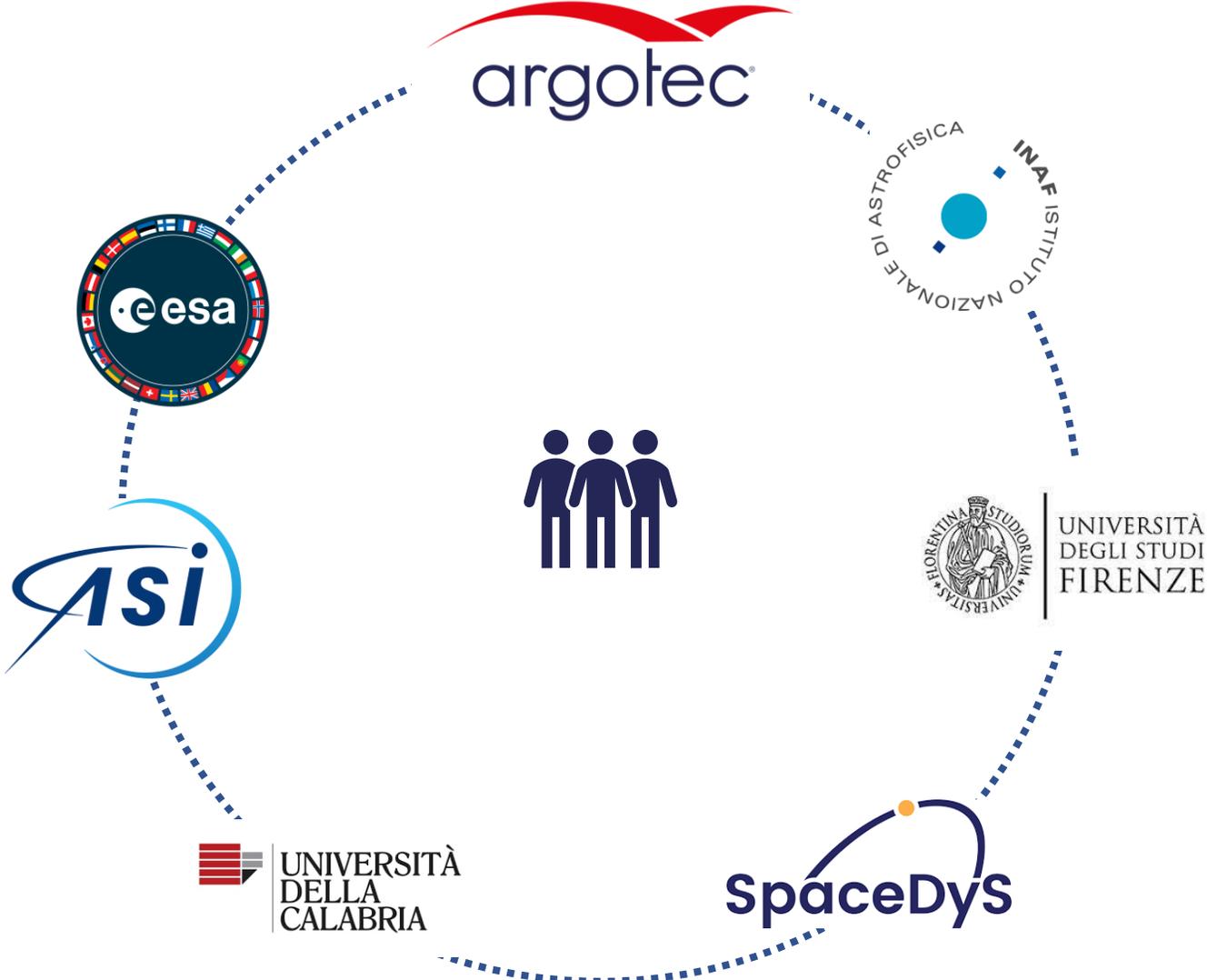
Main objective: Demonstrate near real-time in-situ monitoring of the space environment to provide near real time alerts with increased warning time.

Secondary objectives:

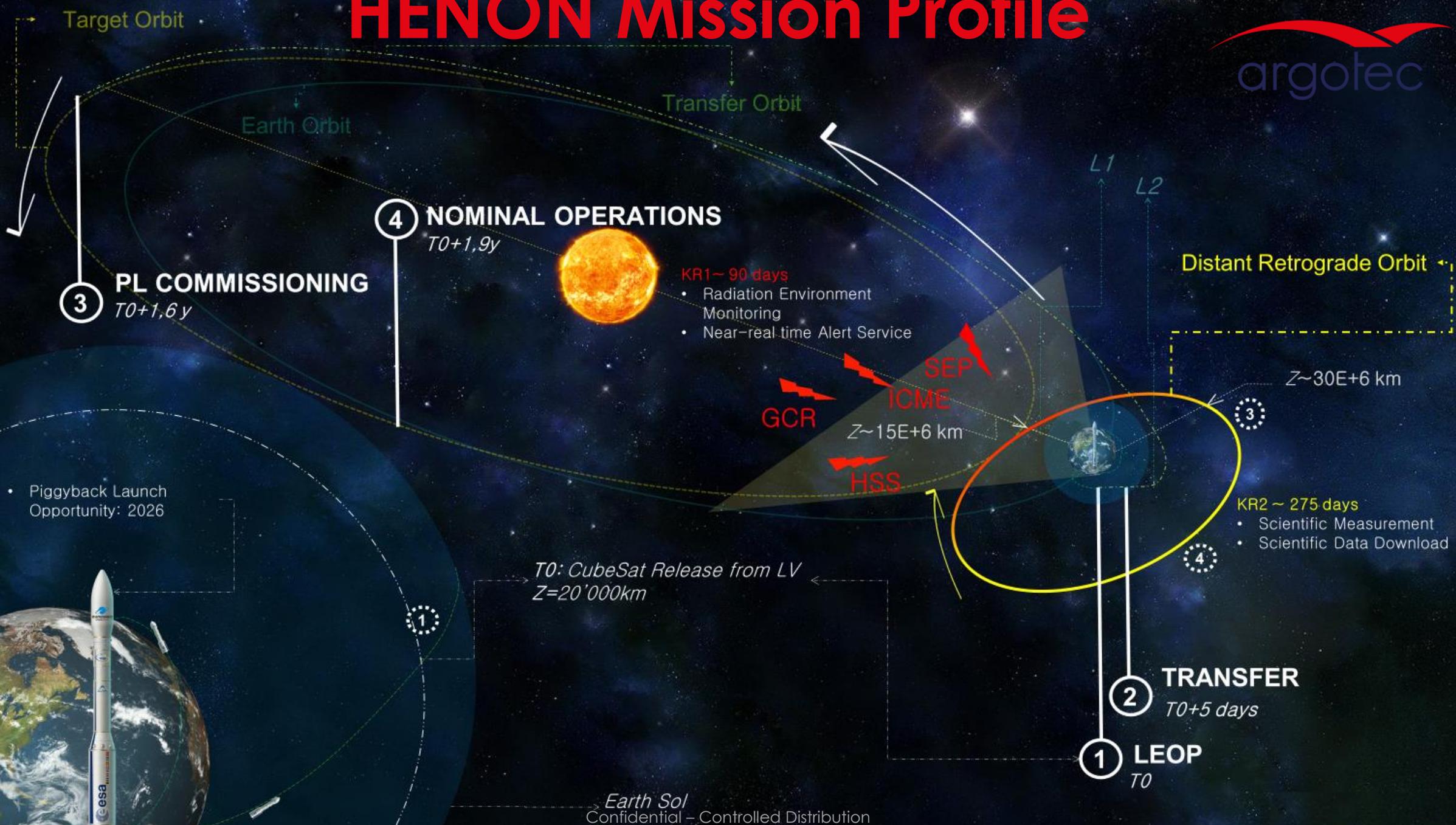
- Enhance the space weather forecasting models
- Operate a S/C in the Sun-Earth DRO



HENON Team



HENON Mission Profile



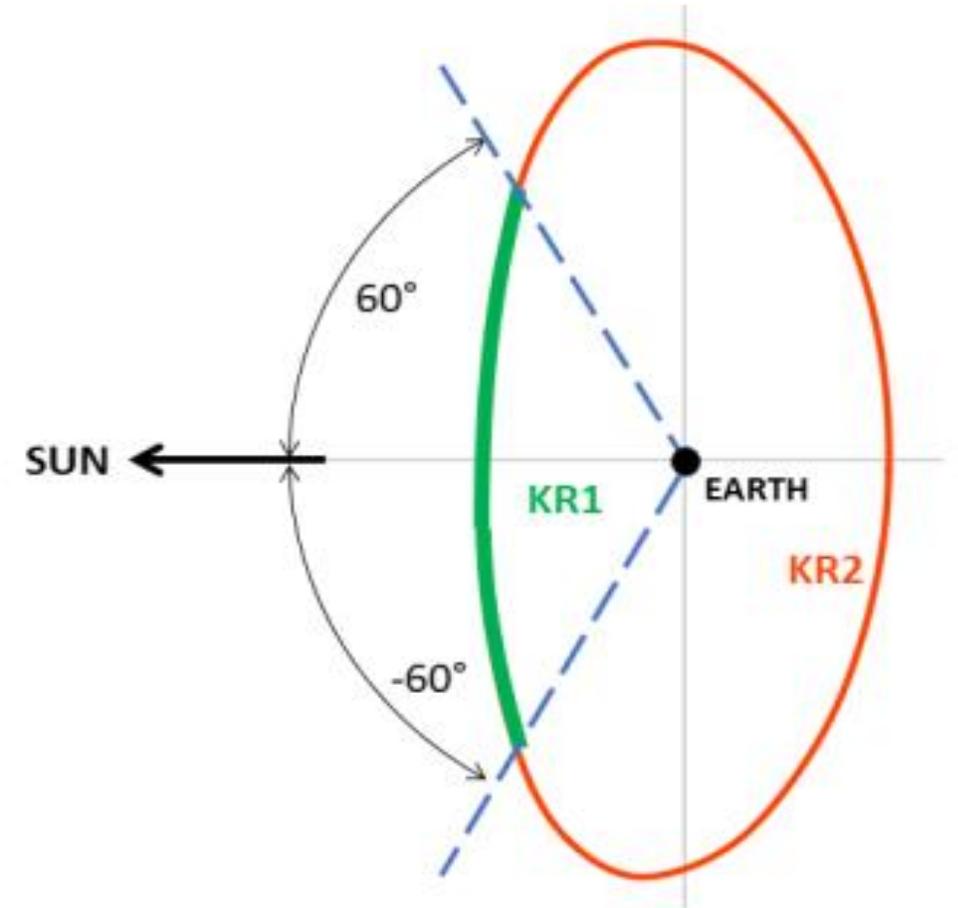
HENON - Operations

Key Region 1:

- S/C is between Sun and Earth. Generation of **near real time alerts** for space weather events
- **On-board processing** of scientific data to detect possibly geo-effective events and generate alerts

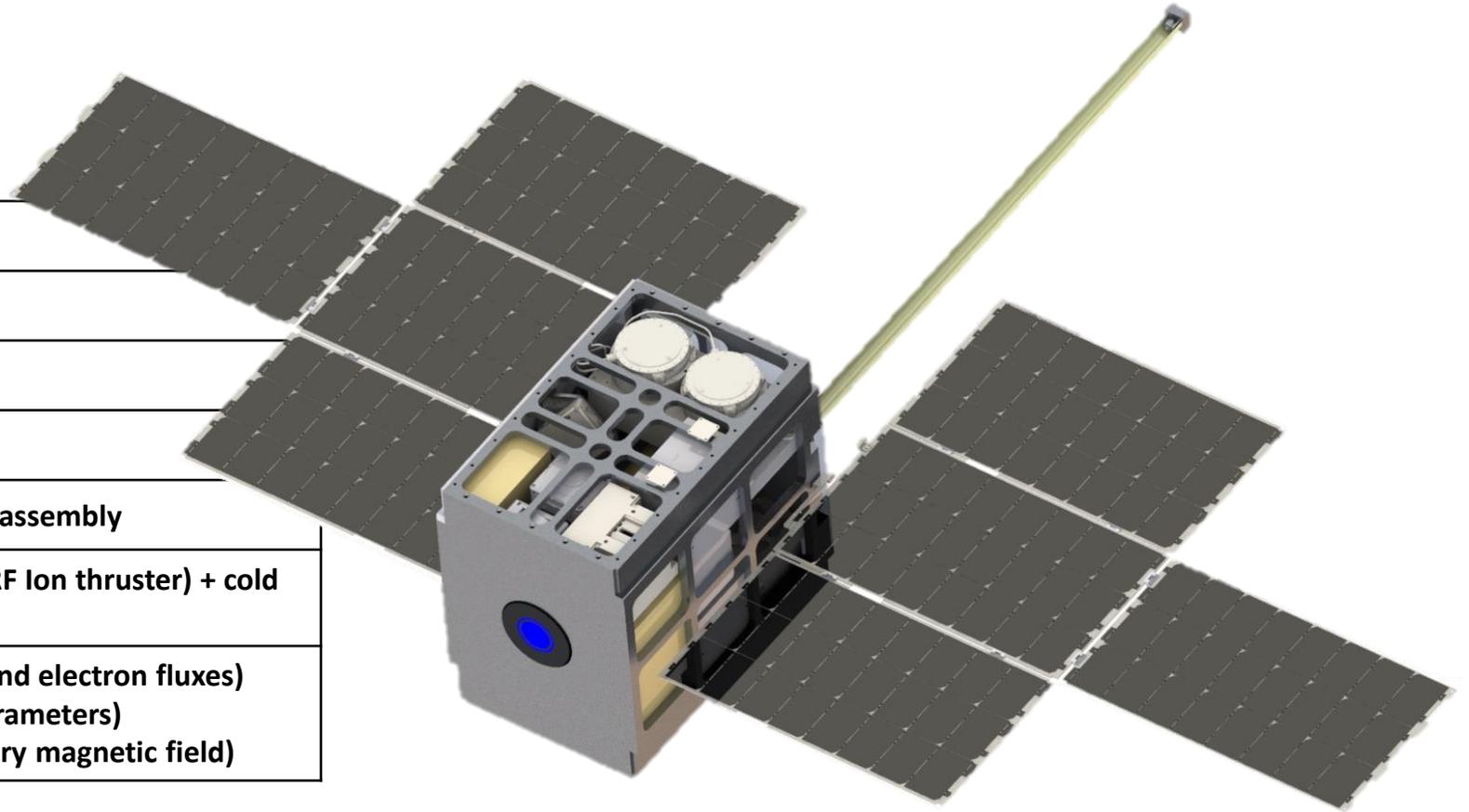
Key Region 2:

- S/C position is not suitable for near real time alerts
- Scientific measurement of space environment to enhance space weather forecasting models



HENON - Overview

| | |
|----------------------|--|
| Mass | 28 kg |
| Volume | 12U |
| Downlink Band | X-Band up to 512 kbps |
| Lifetime | >2.5 years |
| Solar Arrays | 200W generation with drive assembly |
| Propulsion | Electric propulsion system (RF Ion thruster) + cold gas RCS |
| Payloads | Radiation Monitor (proton and electron fluxes) Faraday Cups (Solar wind parameters) Magnetometer (Interplanetary magnetic field) |



HAWK – Past, Present and future



With the successes of LICIACube and ArgoMoon, Argotec became the only company in the world to have performed **two small satellites missions in deep space. The Hawk platform was validated in space.**



HENON and LUMIO are building up on the previous successes, pushing the boundaries even further.

Argotec is constantly looking for collaborations and is happy to investigate further applications of its flight-proven platform

Argotec S.r.l.

Via Cervino 52
Torino, Italy

Argotec Inc.

1801 McCormick Drive
Largo, Maryland



argotec[®]

THANK YOU