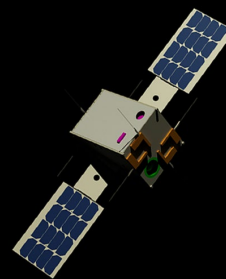


LUMIO CubeSat: A Mission to Refine Meteoroid Population Knowledge

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POLITECNICO
MILANO 1863



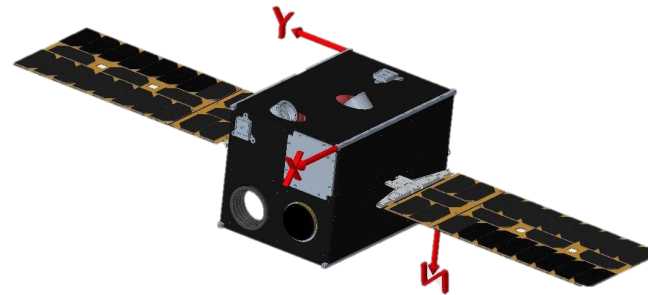
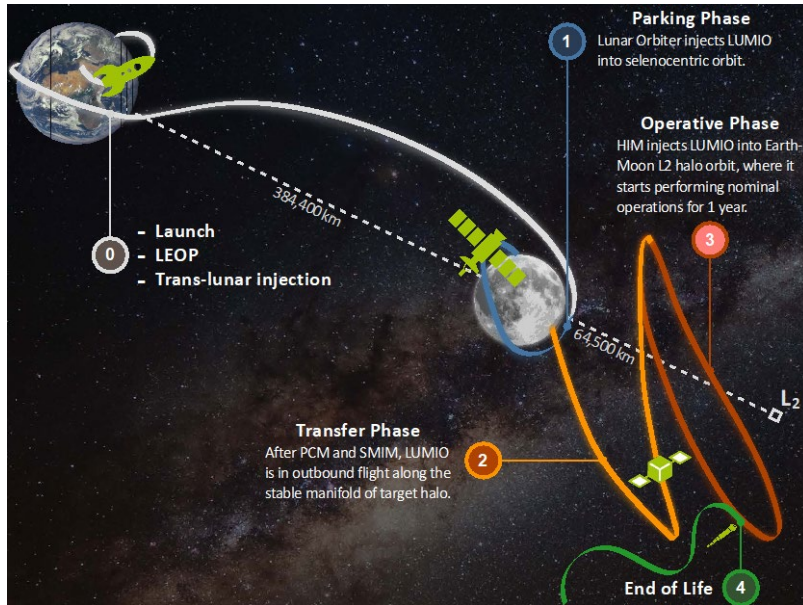
Outline

- ▶ Introduction & context
- ▶ Scientific Output



LUMIO mission

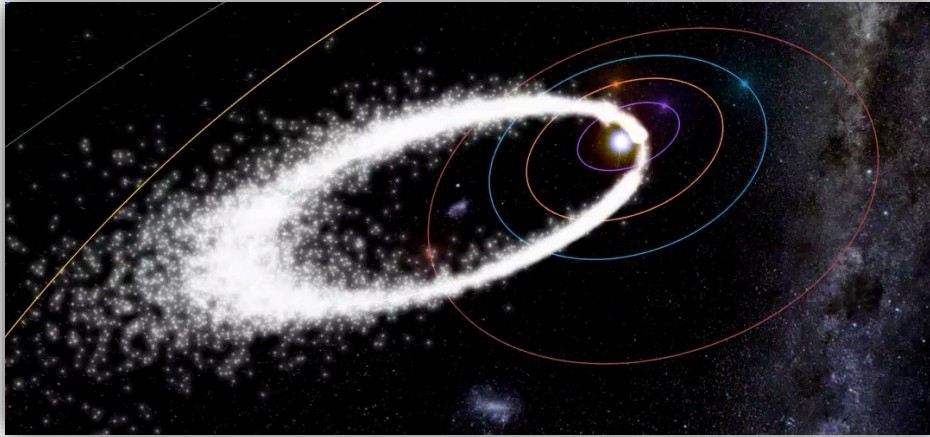
LUMIO is a CubeSat mission to a halo orbit at Earth–Moon L2 that shall observe, quantify, and characterise meteoroid impacts on the Lunar farside by detecting their flashes, complementing Earth-based observations on the Lunar nearside, to provide global information on the Lunar Meteoroid Environment and contribute to Lunar Situational Awareness.



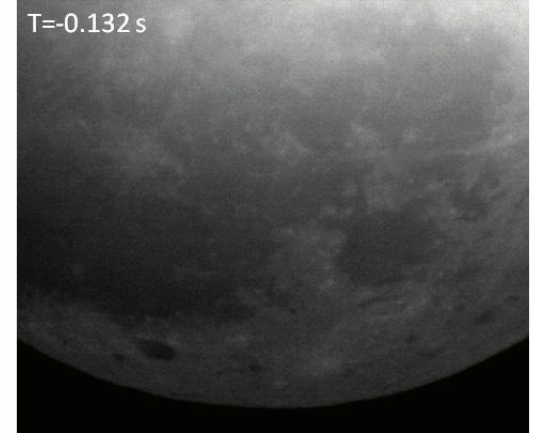
LUMIO CubeSat.

Phase A study
concluded
successfully

Context



Rendering of GEM Shower. CREDIT - www.meteorshowers.org



CREDIT – ESA's NELIOTA

Meteoroid Impacts
on Lunar surface

Crater excavation

Seismic wave

Particles ejection

Radiation emission

$$KE = \frac{E_V}{\eta}$$

- ▶ **Observation:** lunar nightside
- ▶ **Detection:** short-lived light flashes
- ▶ **Magnitude:** [+10, +5]
- ▶ **Duration:** < 100 ms

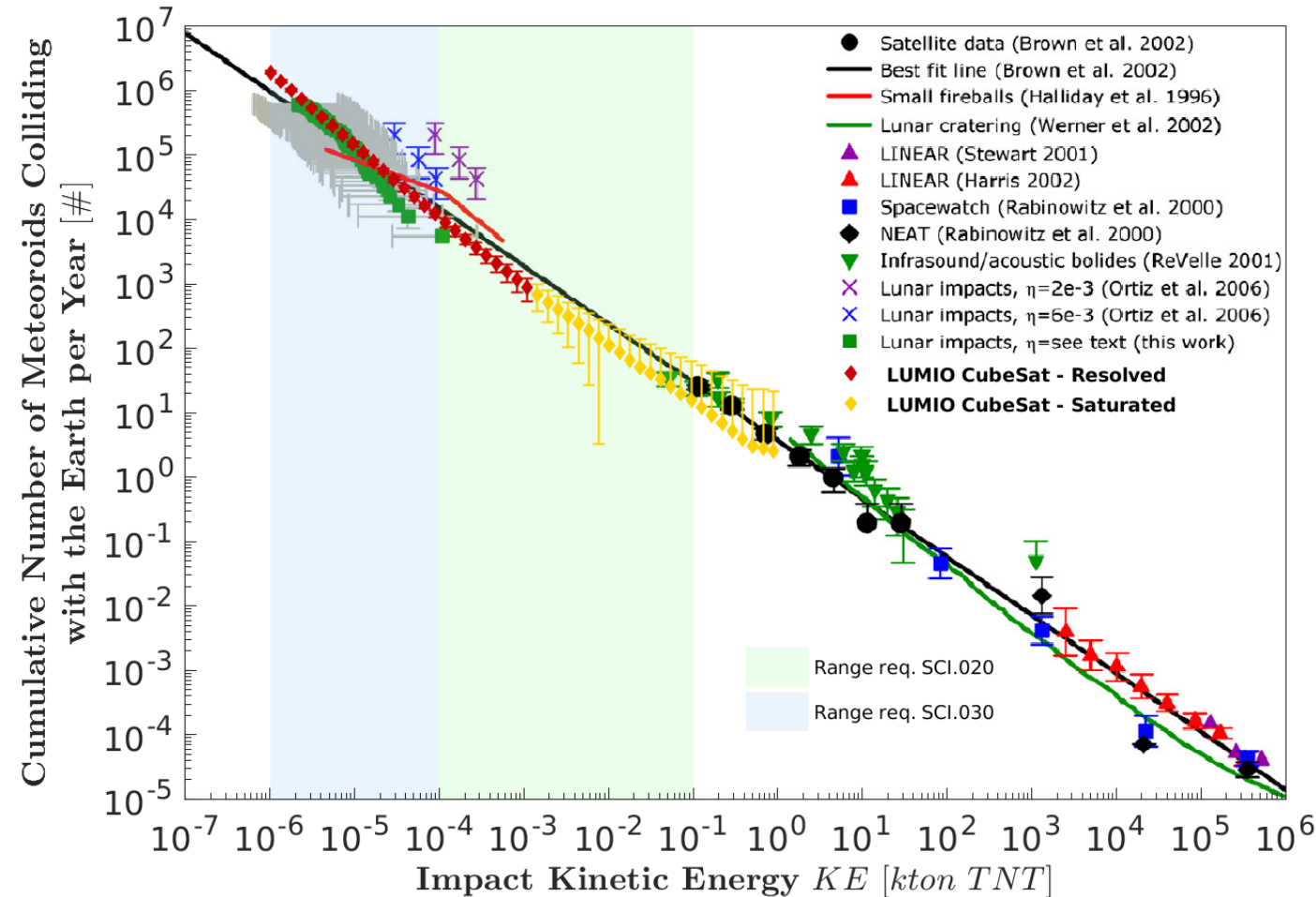
Earth-based monitoring programmes:

NASA MSFC (2006-)

NELIOTA under ESA contract (2017-)

MIDAS, Spain (2001-2004, now)

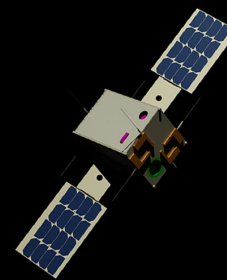
Scientific Output



Comparison of the estimated LUMIO lunar CubeSat scientific return with the scientific return of previous programmes. Data of previous programmes taken from *Suggs et al. (2014)*.

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