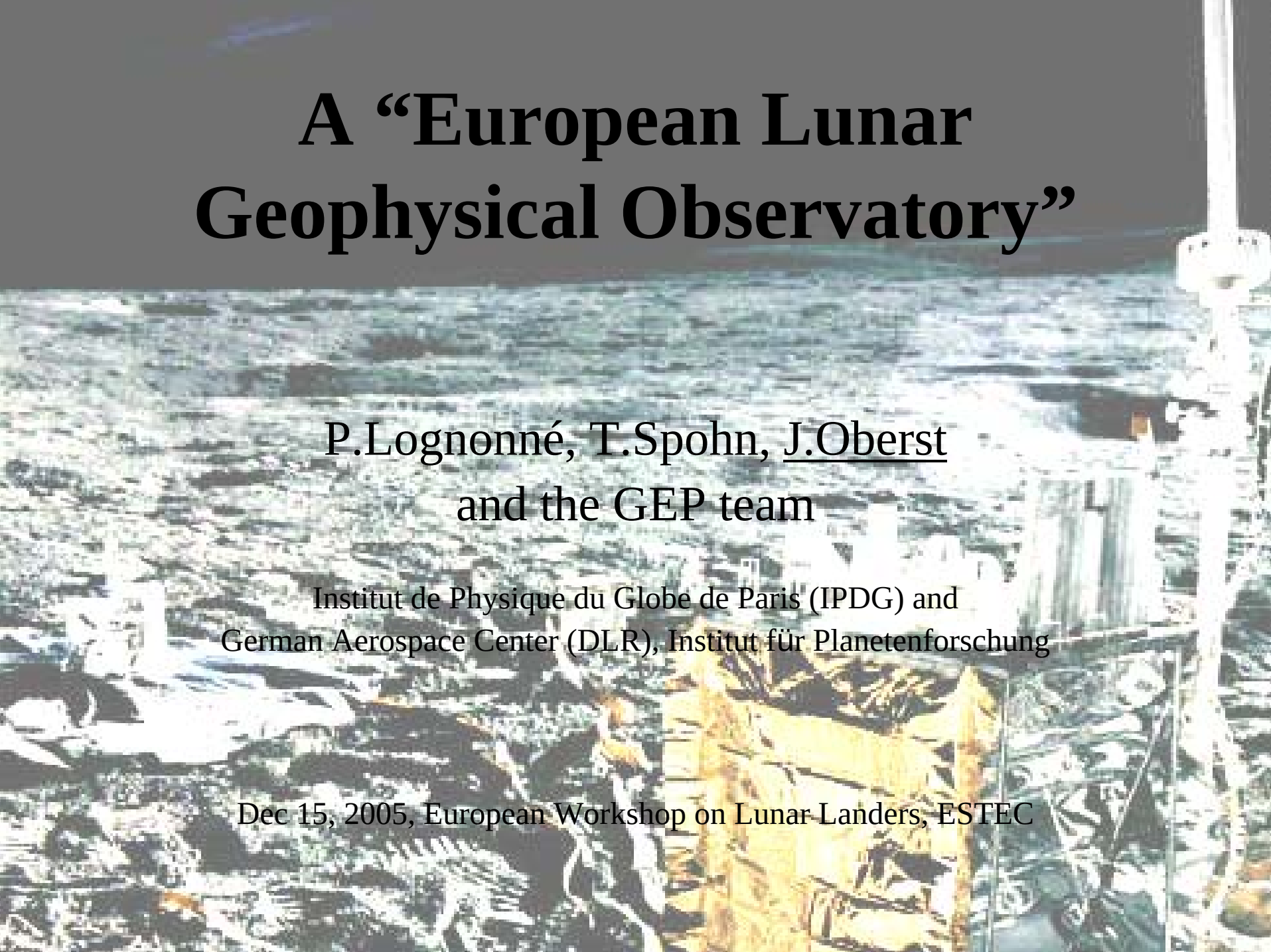
A “European Lunar Geophysical Observatory”



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Dec 15, 2005, European Workshop on Lunar Landers, ESTEC

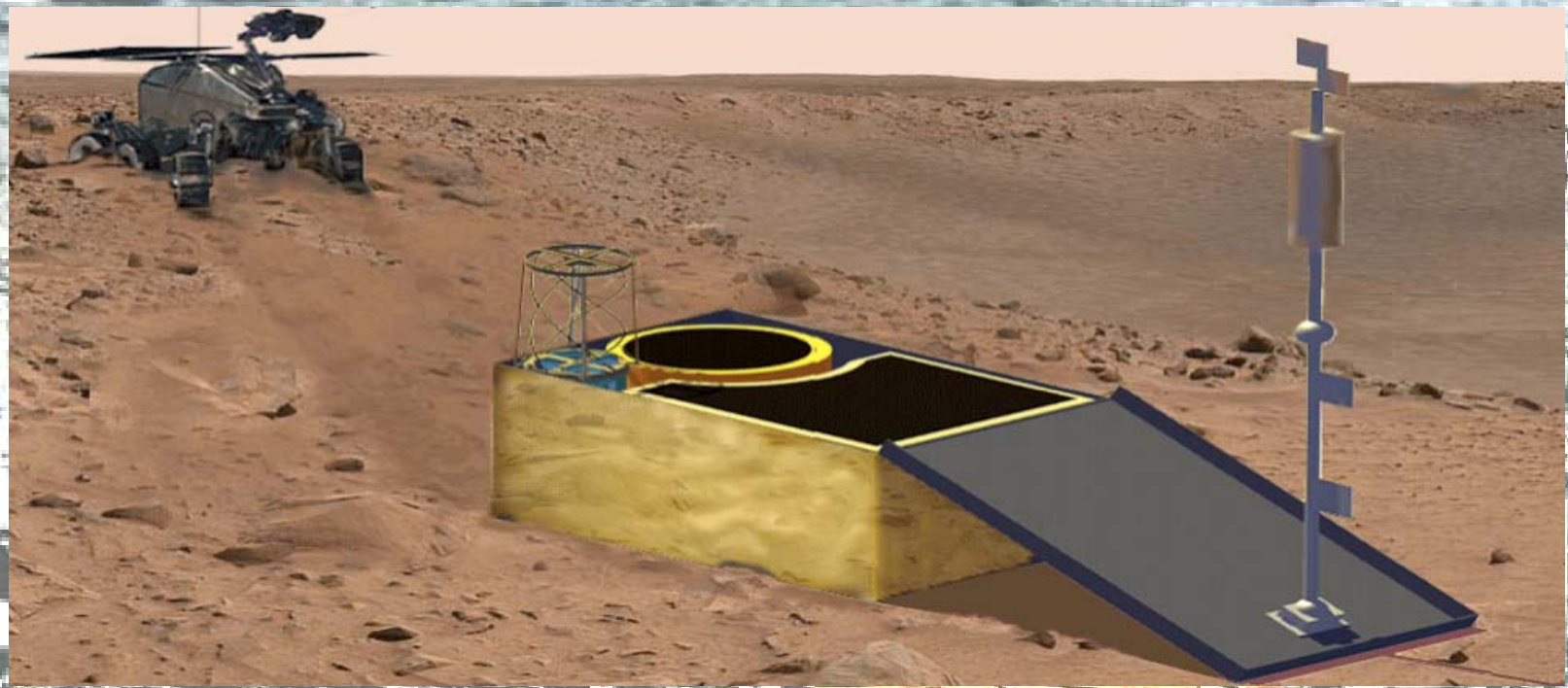
Why a «Next Generation ALSEP»?

- New heat flux measurements needed
  - only 2 measurement of the Lunar heat flux
  - large dispersion
- More Earth-Moon ranging data needed
  - all Apollo and Lunoxod laser reflectors still working !
  - no reflectors at high latitudes
  - little data on Lunar tides and core signals
- Joint magnetic field observations needed
  - joint orbital/surface field observations can be used to detect the core magnetic induced signal
- Continued seismic monitoring needed
  - Apollo network was small and restricted to equatorial near-side area
  - Deep Moonquakes have fixed position and show periodic activity == > new moonquake data can be inverted together with the old Apollo ALSEP data
  - no broadband seismic observations or long period observations done by Apollo (no free oscillation detections so far)

European Lunar Geophysical Observatory

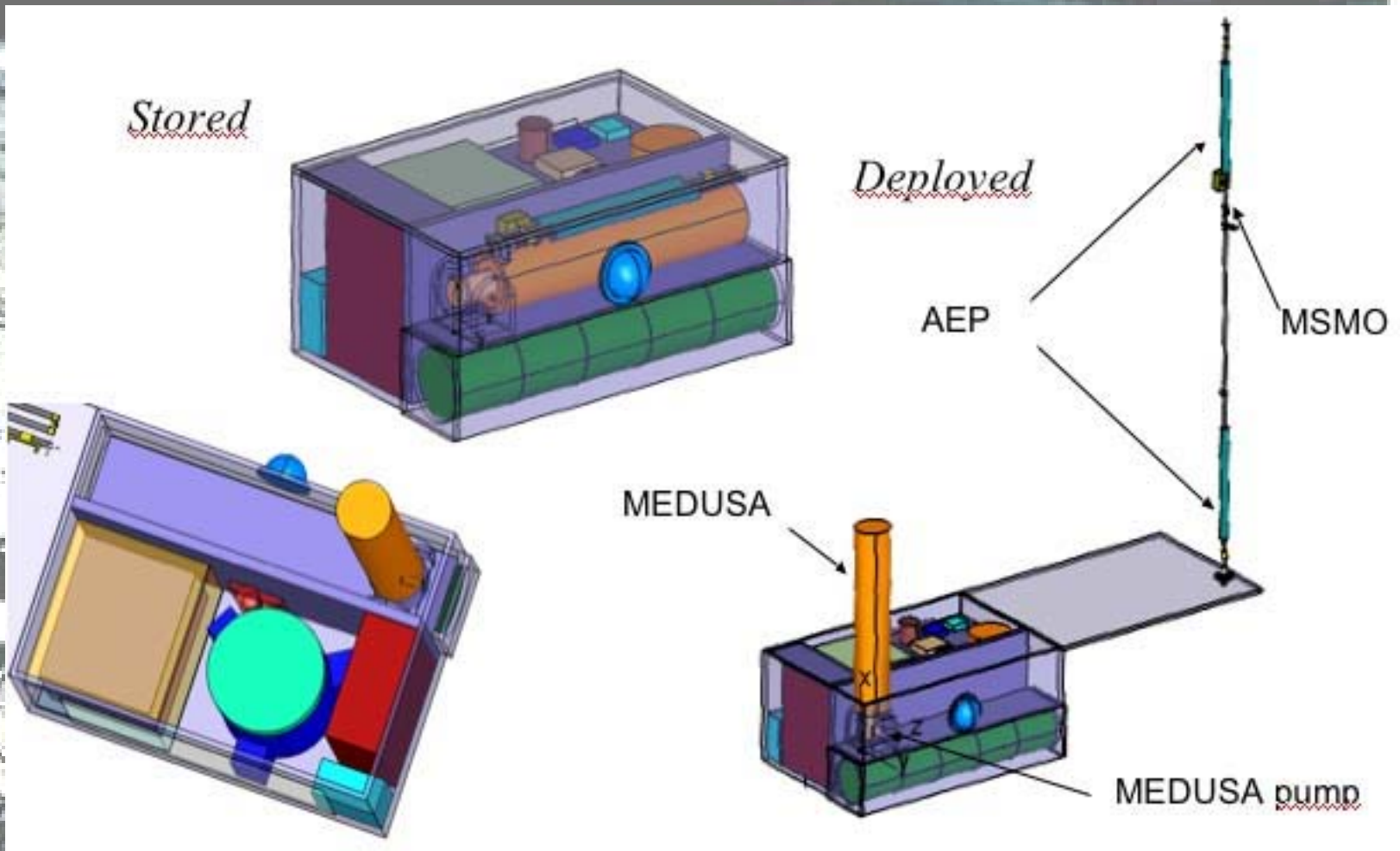
- autonomous long-lived operation (5-10 years)
  - radiogenic power source (RTG)
  - direct Earth communications
- 0.7 x 0.5 x 0.3 m
- < 20 kg
- will benefit from synergy with the ExoMars GEP (launch: 2011)

GEP – Geophysical Package

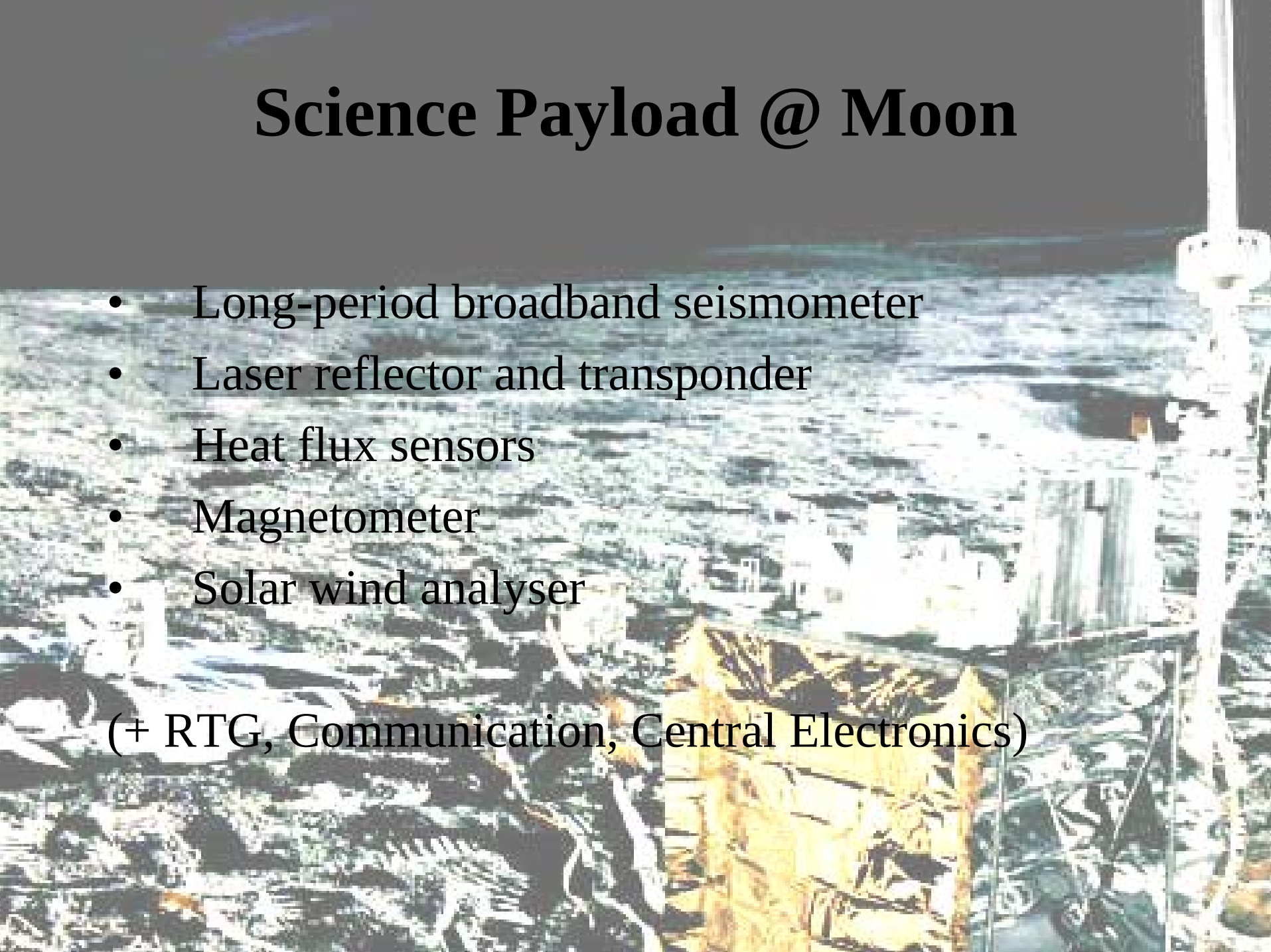


Artist‘s view of GEP after deployment by a rover

GEP – Geophysical Package



Science Payload @ Moon



- Long-period broadband seismometer
- Laser reflector and transponder
- Heat flux sensors
- Magnetometer
- Solar wind analyser

(+ RTG, Communication, Central Electronics)

Flight opportunities

- SELENE 1B Lander (2012)
- Chinese Lander (2015?)
- US Lunar Lander(s) (2010)
- European Technology Lander
- Future human missions

Deployment of multiple GEP packages will create a new Lunar geophysical network by 2012-2015