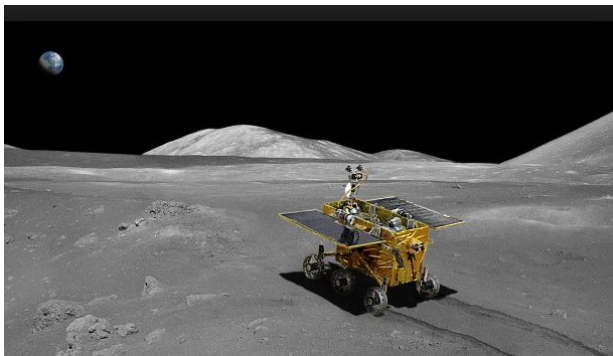


NEWTON – NEW portable multi-sensor scientific instrument for non-invasive ON-site characterisation of rock from planetary surface and sub-surfaces

THE PROBLEM

Apart from the Earth, the Moon, Mars, Ganymede and possibly Mercury have an intrinsic magnetic field. On the Moon and Mars, this magnetic field is purely the remanent signature of a past global magnetic field whose characteristics remain partly inaccessible. This is because to date systematic magnetic surveys on Mars, Mercury and the Moon have been only performed by satellites in orbit. Surface measurements were only performed on the Moon during the Apollo era and revealed dramatically varying magnetic fields over kilometre scales.

Worldwide experts in planetary magnetism strongly recommend magnetic prospections on ground with rovers to obtain detailed magnetic signatures and rocks susceptibilities prior to sample-return missions. However, they have not been performed so far for the incompatibility of magnetic instrumentation with the magnetic noise of the landed platforms.



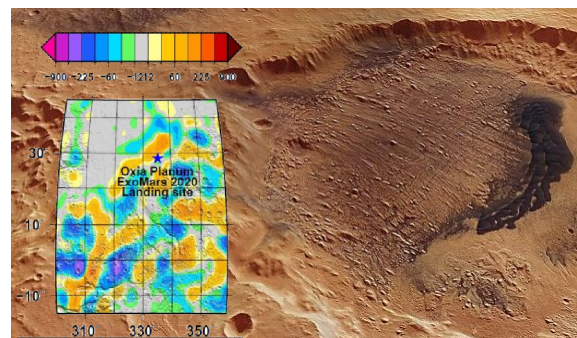
THE SOLUTION

NEWTON project is developing a scientific magnetic multi-sensor instrument for use in space, science and planetary exploration which provides a first opportunity to perform high resolution and complete non-invasive in-situ magnetic characterization of planetary surfaces and subsurfaces.

The **NEWTON** instrument will deliver unique information on the magnetic structure stored during the formation of the measured rocks and thus information on the primigenial global magnetising field. Additionally, **NEWTON** multi-sensor instrument will give information related to the past geological history of the celestial bodies as well as tectonically-induced changes in their orientation and thus on the planet history.

NEWTON TECHNOLOGY

NEWTON project introduces magnetic susceptometry, real and imaginary parts, as a complement to existing compact vector magnetometers for planetary exploration. The novel instrument includes magnetometer, portable susceptometer, innovative power supply system immune to the radiation and sophisticated frequency generation system. The goal of **NEWTON** project is to achieve a TRL6, to make the multi-sensor instrument suitable for boarding on a planetary exploration rover in the short term.



EXPECTED IMPACT

NEWTON technological advance will be applied to solve some of the open questions on the crustal evolutions within the Solar System: the disputed origin of high energy cratering, the magnetic signatures of ore formation processes, the highly intense anomalies of Mars and the origin of Phobos and Deimos. The new product provides such an approach to magnetometry, which is also expected to be applied to geophysical engineering like oil and energy industries for a better in-situ interpretation with the consequent time and cost savings.

Interested?


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NEWTON Consortium



Funded by



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