

STARTING A EUROPEAN SPACE AGENCY SAMPLE ANALOGUE COLLECTION FOR ROBOTIC EXPLORATION MISSIONS.

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Introduction: The Natural History Museum is working closely with the European Space Agency and the UK Space Agency to develop a European collection of analogue materials with appropriate physical/mechanical *and* chemical (mineralogical) properties which can support the development and verification of both spacecraft and scientific systems for potential science and exploration missions to Phobos/Deimos, Mars, C-type asteroids and the Moon. As an ESA Collection it will be housed at the ESA Centre based at Harwell (ESA-ECSAT).

Background: The “ESA Sample Analogues Collection” will be composed of both natural and artificial materials chosen to (as closely as possible) replicate the surfaces and near-surfaces of different Solar System target bodies of exploration interest. The analogue samples will be fully characterised in terms of both their physical/mechanical properties (compressive strength, bulk density, grain shape, grain size, cohesion and angle of internal friction) and their chemical/mineralogical properties (texture, modal mineralogy, bulk chemical composition – major, minor and trace elements and individual mineralogical compositions). The Collection will be fully curated to international standards including implementation of a user-friendly database and will be available for use by engineers and scientists across the UK and Europe. Enhancement of the initial Collection will be possible through collaborations with other ESA and UKSA supported activities, such as the acquisition of new samples during field trials.