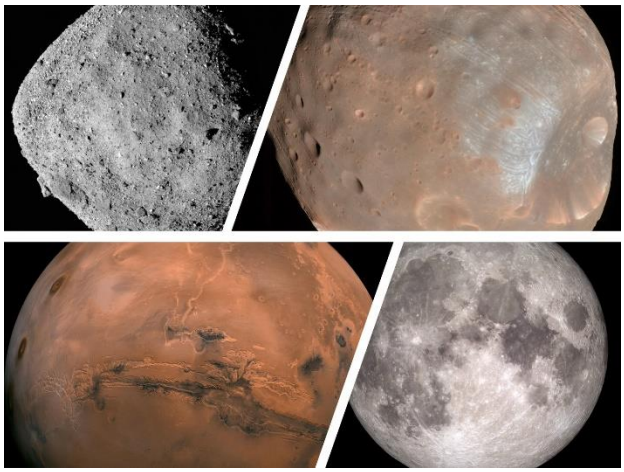
Analysis of Returned Extraterrestrial Materials: Current Capabilities & Future Opportunities

Virtual RAS Specialist Discussion Meeting

11th December 2020



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To date space missions have collected and returned to Earth samples of the Moon (Apollo/Luna), from low Earth orbit (e.g. LDEF), the solar wind (Genesis), a comet (Stardust), and a stony asteroid (Hayabusa). Returned extraterrestrial materials offer context for our meteorite collection, ground-truth astronomical and remote observations, and can be studied in unparalleled detail in the laboratory, leading to ground-breaking discoveries about planet formation that are not possible through in-situ spacecraft measurements alone. Furthermore, returned samples become available for the technology and scientific questions of the future.

Samples will soon be returned from the carbonaceous near-Earth asteroids Ryugu (Hayabusa2 in 2020) and Bennu (OSIRIS-REx in 2023), while there are ambitious plans to bring back materials from the Moon, Phobos and Mars within the next ~10–20 years. Successful characterisation of these complex and precious materials requires the planning and development of new analytical methods and protocols today.

This meeting will bring together the international sample analysis community to discuss the current and future analytical and curation capabilities that will maximise the scientific impact of extraterrestrial sample return missions. We aim to review recent advances in electron microscopy (e.g. SEM, FIB/TEM) and mass spectrometry (e.g. SIMS, ICP-MS), highlight the capabilities and upcoming opportunities at synchrotron facilities, and explore new pioneering techniques (e.g. nano-IR, atom probe, magnetic properties) and their application to extraterrestrial materials.

We invite abstracts for talks (~15 mins) and flash presentations (~3 mins) on topics related to the laboratory analysis of extraterrestrial materials.

Abstract Deadline – 9th November 2020

Schedule Announced – 13th November 2020

Abstracts (~300 words) & other enquiries should be sent to Ashley King (a.king@nhm.ac.uk)

Registration Details - https://tinyurl.com/yynoa4ax

Organisers: Ashley King (NHM), Natasha Almeida (NHM), Luke Daly (University of Glasgow), Leon Hicks (University of Leicester), Natasha Stephen (University of Plymouth), Romain Tartese (University of Manchester) & Penny Wozniakiewicz (University of Kent).

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