

Analysis of Returned Extraterrestrial Materials: Current Capabilities & Future Opportunities

Virtual RAS Specialist Discussion Meeting

11th December 2020



10:00 (GMT) **Welcome & Introduction**

Invited Talks

- 10:05 JAXA's MMX MISSION AND IMPLICATIONS FOR SAMPLE ANALYSIS.....*Sara Russell et al.*
- 10:20 LABORATORY ANALYSIS FOR RESEARCH INTO EXTRATERRESTRIAL SAMPLES (LARES)
.....*Monica Grady et al.*
- 10:35 ESA'S SAMPLE ANALOGUE CURATION FACILITY.....*Dayl Martin et al.*
- 10:50 MARS SAMPLE RETURN – OPPORTUNITIES FOR THE SCIENCE COMMUNITY.....*Gerhard Kminek et al.*

Flash Talks

- 11:05 BIOGENIC MAGNETIC NEEDLES IN THE MARTIAN SEDIMENTARY HAYSTACK: SEARCHING FOR
MAGNETOFOSSILS IN JEZERO CRATER LACUSTRINE SEDIMENTARY ROCKS PROBED DURING THE
MARS SAMPLE RETURN CAMPAIGN.....*J. Larrasoña et al.*
- 11:08 PHOTOGRAMMETRY FOR DETERMINING THE PHYSICAL PROPERTIES OF METEORITES
.....*T. Harvey et al.*
- 11:11 INSTRUMENTATION FOR BASIC CHARACTERISATION OF MARS MATERIAL UNDER CONTAINMENT
.....*L. Adam et al.*
- 11:14 NON-CONTACT MILLIMETRE-WAVE SENSING OF ROCK MATERIAL PROPERTIES.....*J. Blanche*
- 11:17 NANO-SCALE SYNCHROTRON AND MICROSCOPY ANALYSIS OF RETURNED EXTRATERRESTRIAL
MATERIALS.....*L. Hicks & J. Bridges*

Morning Session

- 11:20 DIAMOND IS A SCIENTIST'S BEST FRIEND: AN OVERVIEW OF CURRENT, AND FUTURE, ANALYTICAL
CAPABILITIES AT THE UK SYNCHROTRON FACILITY.....*J. Parker*
- 11:32 PLANETARY SAMPLE ANALYSIS LABORATORY (SAL) AT DLR.....*E. Bonato et al.*
- 11:44 USING THE TECHNOLOGY DEVELOPED FOR MARS RETURN FOR OTHER EXTRATERRESTRIAL
MATERIALS.....*J. Vrubleviskis et al.*
- 11:56 INVESTIGATING RETURNED SAMPLES WITH MÖSSBAUER SPECTROSCOPY.....*C. Schröder et al.*

12:08 **Lunch Break**

Flash Talks

- 12:40 NANO-IR ANALYSIS OF RETURNED CARBONACEOUS ASTEROID MATERIAL.....*J. Young et al.*
- 12:43 NANOFTIR: THE TECHNIQUE, THE RESULTS AND ONE RESEARCHER'S EXPERIENCE OF IT
.....*W. Montgomery*
- 12:46 APPLICATIONS OF THE NEUTRON-IRRADIATION NOBLE GAS MASS SPECTROMETRY (NI-NGMS)
TECHNIQUE TO DETERMINING THE HALOGEN COMPOSITION OF RETURNED EXTRATERRESTRIAL
MATERIALS.....*P. Clay et al.*
- 12:49 3D ANALYSIS OF THE APOLLO 17 73002 CORE SAMPLE TO IDENTIFY STRUCTURES LINKED TO THE
LIGHT MANTLE LANDSLIDE EMPLACEMENT MECHANISM.....*G. Magarini et al.*

Afternoon Session

- 12:52 NON-DESTRUCTIVE, QUANTITATIVE MEASUREMENT OF OLIVINE COMPOSITIONS IN CHONDRITIC MATERIAL, FROM SYNCHROTRON X-RAY MICROCOMPUTED TOMOGRAPHY.....*R. Jones et al.*
- 13:04 THE IMPORTANCE OF CONSIDERING MARTIAN MATERIAL, INCLUDING BIOMARKERS, IN MMX ANALYSES OF PHOBOS SAMPLES.....*Z. Morland*
- 13:16 EVALUATING THE MINERALOGY OF RETURNED SAMPLES FROM BENNU AND RYUGU USING MACHINE LEARNING MULTIVARIATE INFRARED SPECTRAL ANALYSIS.....*L. Breitenfeld et al.*
- 13:28 CHARACTERISING ORGANIC AND MINERAL COMPONENTS IN ASTEROIDAL PARTICLES TO CONSTRAIN PLANET FORMATION MODELS.....*M. Bose*
- 13:40 HIGH PRECISION BULK OXYGEN 3-ISOTOPE ANALYSIS OF RETURNED PLANETARY/ASTEROIDAL SAMPLES.....*R. Findlay et al.*
- 13:52 UNDERSTANDING THE SPACE WEATHERING OF RETURNED SAMPLES THROUGH COORDINATED ANALYSIS.....*M. Thompson et al.*

Flash Talk

- 14:04 SIDEROPHILE ELEMENTS AS TRACERS OF CORE-FORMATION: LINKING THE LAB TO MISSIONS*J. Dhaliwal*
- 14:07 **Break**

Invited Talks

- 14:25 THE LOST METEORITES OF ANTARCTICA: FIELD SEASON RESULTS.....*Jane MacArthur et al.*
- 14:40 FIFTY YEARS OF CURATING NASA'S ASTROMATERIALS COLLECTIONS – PLANNING FOR THE FUTURE.....*Ryan Zeigler*
- 14:55 ON THE PREDICTED NATURE OF THE SAMPLE FROM ASTEROID 101955 BENNU.....*Harold Connolly, Jr.*
- 15:10 – **Discussion**
- 15:30 – **Meeting End**

To register for the meeting please visit - <https://tinyurl.com/yynoa4ax>

Registration is free for RAS Fellows & £5 for Non-Fellows.

Please send any other enquiries to Ashley King (a.king@nhm.ac.uk)

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).

