Day 3: Afternoon

How can the Apollo samples be used to facilitate NASAs return to the Moon while preserving the collection for scientific investigation?

Bring together engineers and scientists from different backgrounds to talk about lunar samples and availability/need for simulants.

Overview of the lunar sample collection **Gary Lofgren**

Good overview of the lunar sample collection and what is pristine;
Good overview of curation procedures and facilities;
Highlighted the samples that are still in the containers they were returned in.

High grading of lunar samples for return to Earth **Carl Allen**

Highlighted the issue of collecting more sample mass than can be returned;
Announced “lunar sample suite” to test instrumentation for sample high grading;
Experiments have already been done using this suite at JSC (see talk by Nunez in this session).

The role of CAPTEM in lunar sample allocation **Meenakshi Wadhwa**

Overview of CAPTEM history and the sample collections administered by CAPTEM;
More frequent lunar sample request deadlines are being explored;
Overview of how to request lunar samples (with web addresses);
Overview of CAPTEM initiatives.

Lunar Sample Requirements for Engineering & Applied Science **Larry Taylor**

Outlines problems of making lunar simulants;
Lunar Ilmenite ≠ Terrestrial Ilmenite – lack of Fe^{3+};
Nanophase Fe = Single domain Fe = < 33 nm;
Outlined unique lunar soil properties needed in lunar soil simulants;
An oversight committee is needed for lunar simulants;
Lunar samples are generally not necessary for most engineering/ISRU + applied science studies, except for mineral beneficiation studies.

Lunar Science Studies using Lunar Samples **Clive R. Neal**

Samples – the gift that keeps on giving;
Need a bibliography of key papers that inform various communities about lunar samples on the CAPTEM/LEAG web sites;
Preservation of samples for the next generation is important for taking advantage of analytical technology advances and advances in scientific understanding;
Samples provide ground truth for orbital data that can then inform further sampling.

Lunar Sample Requirements for agriculture **Rob Ferl**

Biology has come a long way since Apollo – can test old hypotheses with new techniques;
What happens to lunar samples in contact with biology? Previous work does not tell us;
Original work had plants not grown in regolith during the Apollo era, they were grown in the presence of regolith;
A list was given of things (regarding plants) that we don't know.

The need for lunar simulants **Carole Mclemore**

Gave a background on lunar simulant development;
Instructions on how to request simulants;
Simulants are tools for risk reduction and technology advancement;
There is not and never will be a "one size fits all" lunar simulant;
Need better communications between engineering and scientists so better simulants are produced;
A "fit-for-use" matrix is being developed for simulants, which needs to be on the "simulant survey" (http://isru.msfc.nasa.gov/lunarsurvey) web site;
A simulant development, characterization, and production task was shown.

Mitigation of Lunar Dust on Solar Panels and Optical Elements for Lunar Exploration Utilizing Electrostatic Traveling-Wave **Dave McKay**

Electrostatic cleaning of lunar dust from surfaces;
Operates better in a vacuum than in air and is enhanced by ultrasonic vibration;
No degradation in performance, at least in the short term.

Experiments and Field Works with NASA Lunar Samples and Terrestrial Analogues by the Hunveyor Space Probe Model **T. N. Varga**

Built a "lunar lander" with high school and university students along the lines of the Surveyor landers;
Undertook experiments similar to Surveyor (pictures);
Tried to validate a site in Hungary as a lunar analog site.

Lunar Fluids from Carbon and Chlorine Contents of the Apollo Lunar Samples **Y. Miura**

Moon has C-bearing fluids in the interior from primordial C inherited from the giant impact.

Analysis of Apollo Samples with the Multispectral Microscopic Imager (MMI) **J.I. Nunez**

Microscopic imager, 62.5 µm/pixel, 21 wavelengths, no moving parts, FOV 40 x 32 mm;
Gets mineralogy with micro-texture.
Images 18 lunar rocks and 4 lunar soils at JSC – gives false color images that brings out mineralogy and texture.
Resolution needs to be better for lunar soils.