

## **CURATION OF METEORITES VERSUS MISSION RETURNED SAMPLES.**

L. Ferrière and A. Hutzler. Natural History Museum, Burgring 7, A-1010 Vienna, Austria. E-mail: ludovic.ferriere@nhm-wien.ac.at.

Curation mainly consists in the collection, handling, documentation, preparation, preservation ("into the indefinite future"), and distribution of samples for research. Curation of extraterrestrial samples, due to their rarity and pristine state, should, in theory, follow some strict rules.

Meteorites have been curated for a few hundreds of years, being part of natural history collections (the oldest meteorite collection, initiated in 1778, being located at the NHM Vienna), whereas the curation of mission returned samples is only about 45 years old, with the return of lunar samples in the framework of the Apollo program.

Meteorites arrive into collections either as samples recovered shortly after their fall on Earth, others, so-called finds, are collected mainly in hot and cold deserts and were exposed to Earth biosphere for hundreds or thousands of years. All of these samples have interacted with the Earth atmosphere before being recovered on the ground, but even if they were exposed for a very short time to high temperatures (formation of the fusion crust on the surface of the meteorite), their inside remains pristine. Usually not much care is taken during the collection (excepted for most meteorites recovered in Antarctica) and then, the processing and traceability can be somewhat "chaotic". The meteorites are in contact with a large number of materials, liquids (in some cases the cutting is even done with tap water), and other unknown/undocumented contaminants. When it comes to the storage (or display), most of them are stored under uncontrolled atmosphere and to some extent in the same way as minerals, rocks, and other terrestrial samples.

In the case of sample return missions, all steps, from the collection of the samples until the arrival in the specific facility, have to be properly documented. Curator(s) should already be consulted during the mission design to insure proper monitoring of the contamination. Importantly, each of the collected and curated samples have a unique (and distinct) history and come from different environments, therefore, the different types of samples present specific and unique challenges for appropriate curation and to insure their integrity. In order to preserve the scientific value of these precious samples, contamination, but also physical and chemical alteration must be minimized, understood, and properly recorded. Different documentation, handling, preparation, and storage technologies were designed, developed, and tested in the last decades but still some issues remains to be further investigated.

In the frame of EURO-CARES, a project which consists in the development of a roadmap for a European Sample Curation Facility, most of these issues will be investigated.