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NASA's Astromaterials Collections

JEMMA DAVIDSON

NASA Johnson Space Center

The Astromaterials Acquisition and Curation Office at NASA's Johnson Space Center (JSC) serves as the steward of NASA's extraterrestrial sample collections, ensuring their preservation, integrity, and accessibility for scientific research. The office's mission, guided by NASA Policy Directive 7100.10F and NASA Procedural Requirement 7100.5 [1], is to protect and maintain these invaluable collections under rigorous contamination control protocols while enabling their global scientific study. JSC Curation manages specialized facilities designed to meet curation and contamination control requirements at both JSC and a remote storage back-up facility.

The current collections run the gamut of extraterrestrial samples types: Apollo lunar rocks, Antarctic meteorites, cosmic dust, microparticle-impacted hardware, solar wind particles, Comet 81P/Wild 2, and asteroidal samples returned by JAXA's Hayabusa and Hayabusa2, and NASA's OSIRIS-REx. Samples are made available for scientific study through a rigorous peer-review process via the Astromaterials Allocation Review Board (AARB). The JSC Curation website [2] provides details of the samples available for scientific study and the request process. Additionally, the curation office is preparing for samples to be returned by groundbreaking campaigns and missions, including those from Earth's moon by NASA's Artemis campaign and Mars' moon, Phobos, by JAXA's MMX.

The JSC Curation office also undertakes Advanced Curation research and development to improve curation technologies to enhance the current collections, enable upcoming (aka "emerging") collections, and prepare for future returns that will require new curation strategies. Future sample returns from icy and volatile-rich bodies will demand innovative technologies and expanded infrastructure to handle diverse sample types and ensure scientific integrity. The JSC Curation office is currently undertaking a trade study across industry, academia, and US Government agencies to identify technologies that could be used and/or modified for the cold curation of such material.

International collaboration is central to these efforts, with curation working closely with global partners (including CSA, ESA, and JAXA) to share best practices, curation standards, and enable broad scientific participation in the analysis of returned samples.

References: [1] National Aeronautics and Space Administration (NASA) (2023), *NASA Procedural Requirements (NPR) 7100.5, Curation of Institutional Scientific Collections.* [2] https://curator.jsc.nasa.gov/