

XSPACE: AN LPI-ARES (JSC) FACILITY FOR CURATION OF METEORITES. J.B. Balta¹, C. A. Goodrich¹, F.M. McCubbin², N.G. Lunning², J.W. Boyce², J. Filiberto². ¹Lunar and Planetary Institute (3600 Bay Area Blvd. Houston TX 77058, xspace@lpi.usra.edu), ²NASA Johnson Space Center (Houston TX 77058).

Introduction: The XSPACE (eXtraterrestrial SamPLe, Analyses, Curation, and Exploration) laboratory is a facility dedicated to the classification and curation of non-Antarctic meteorites. A partnership between the Lunar and Planetary Institute (LPI) and the Astromaterials Research and Exploration Science (ARES) division of NASA, Johnson Space Center (JSC), XSPACE has been approved as an official meteorite repository by the Nomenclature Committee of the Meteoritical Society.

Facilities: The XSPACE collection is housed in a dedicated room in the LPI (USRA-Houston) building equipped with Viking Preservation Model 920 Series curation cabinets and humidity-controlled desiccators (Fig. 1).



Fig. 1: XSPACE Storage cabinets, desiccator, and workspace at the LPI.

The LPI has available sample analysis and processing tools. These include sample preparation and polishing equipment, a Leica EM ACE600 carbon coater, and a benchtop Phenom XL SEM from Nanoscience Instruments.

Samples: The collection (XSPACE - Meteorite Database) currently consists of a small number of donated meteorites including martian, HED, and ureilite samples, and holds samples of the Cranfield Meteorite, observed to fall in Mississippi in 2022 and collected by a joint LPI-JSC team (Fig. 2, [1]). In the future, XSPACE will become the official curation site for samples on loan from the University of Khartoum (UoK) collection of stones from the 2008 Almahata Sitta meteorite fall (Fig. 3, [2]).



Fig. 2: Samples of the 2022 Cranfield Meteorite held in the XSPACE collection.



Fig 3. Samples in the XSPACE Collection.

Samples from the XSPACE collection are available for scientific study. A sample request form is available online at <https://www.lpi.usra.edu/science/science-labs-equipment/xspace/request-samples/> and can be submitted through email to xspace@lpi.usra.edu.

Archiving goals: NASA's PSD now requires an Open Science and Data Management Plan (OSDMP) including a plan for making available all data and samples used during any funded study. This includes any astromaterials purchased during the research, including meteorites, micrometeorites, and cosmic dust, as well as analog samples and biomaterials created for astrobiology research. Proposals are recommended to identify an appropriate archive where materials can be curated, and XSPACE is an available and appropriate archive capable of sample curation and archiving.

PSD has also established rules requiring archiving of materials used for astrobiological studies, including synthesized or collected analog materials or standards. The XSPACE facility is also capable of storing these materials if no special conditions are necessary (e.g., dry cabinet storage is acceptable) and is willing to accept them from researchers.

PSD does not currently require similar archiving of all materials collected and produced for studies outside of astrobiology. However, PSD currently recommends archiving of such materials if it is feasible to do so and if there is scientific utility in doing so. In the long term it is possible such archiving requirements could become more stringent and an appropriate archival facility for all samples could be required. XSPACE is similarly available as an appropriate long-term archiving and storage location for samples of collected rocks and experimental materials and may be willing to add these materials to our collection after consultation with PIs.

XSPACE also looks to establish connections with researchers who have developed collections of meteorites or other astromaterials through previous proposals and work. XSPACE is able to accept these materials for long term archiving and to ensure their continued availability to the scientific community. More information and introductions can be made by contacting us at our email address, xspace@lpi.usra.edu. We hope to hear from you.

[1] Welzenbach, L. C., et al. (2023). *54th LPSC*, Abs. #2860. [2] Shaddad, M. H. et al. (2010). *Maps* 45(10–11), 1557–1589.