

# THE ASTROMATERIALS DATA SYSTEM

## TRANSFORMING ACCESS TO PLANETARY SAMPLE DATA

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The Astromaterials Data System welcomes Shauna Morrison (Geophysical Lab, Carnegie Institution), who recently joined the team.



The Johnson Space Center's Astromaterials Curation Office and the EarthChem group at the Lamont-Doherty Earth Observatory have embarked on a major project to develop a comprehensive data system for all analytical data generated from JSC's astromaterials collections - **the Astromaterials Data System (AstroMat)**.

**AstroMat** will ensure the long-term preservation and access of geochemical, mineralogical, and geochronological data for specimens curated at JSC, data that today are highly fragmented and distributed over decades of publications and conference abstracts or have remained unpublished in labs and investigators' personal files and are at risk of being lost. **AstroMat** will establish a context-rich searchable database that will enable new ways of mining and analyzing these data anticipating the creation of new knowledge. **AstroMat** will ensure reusability of the data and their lasting impact on science, thus maximizing the return of NASA's investment into sample return missions, sample curation, and data acquisition on these samples.

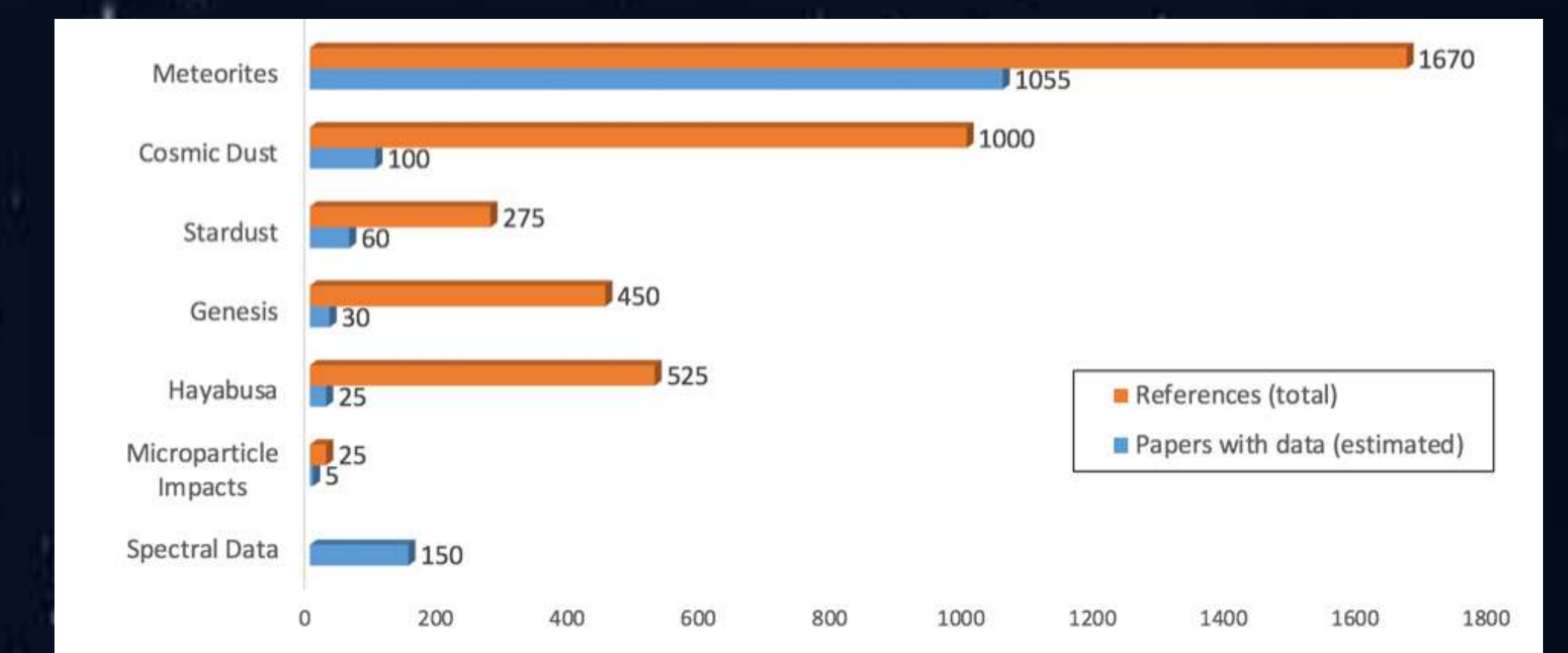
**AstroMat aims to facilitate discovery, access, mining, publication, and preservation of laboratory data acquired on astromaterials samples.**

NOTE: The MoonDB data synthesis of geochemical and geochronological data for lunar samples (Apollo samples and lunar meteorites) will be hosted by the Astromaterials Data System in the future.

**Please visit our poster on MoonDB at poster location #700**

### Restoration of Historic Data

Approximately 1,500 publications have so far been identified that contain laboratory analyses for the Antarctic Meteorite, Cosmic Dust, Genesis, Hayabusa, Stardust, and Microparticle Impact collections. These data will be compiled into the AstroDB synthesis, together with a wide range of information pertaining to the provenance of the analytical measurements (e.g., analytical instrumentation, laboratory, sample preparation procedures, instrument calibration, data reduction) and to the quality of the data. Focus will initially be on geochemical, mineralogical, and geochronological data, but content will be extended later to include additional data types such as experimental petrology, images, and spectrography. About 1,000 papers will be added for the lunar collection, of which 700 have already been compiled for the MoonDB synthesis.



Estimated effort of data restoration by collection.

### AstroMat System Components

**AstroMat** is developed as an ecosystem of databases and software applications that help researchers, data curators, and developers track, manage, access, search and explore data and will comprise the following components:

**AstroRepo** is a trusted repository service for user-submitted digital content from astromaterials research (analytical data, data synthesis, images, models, etc.), that supports researchers in sharing their data and complying with funders' and publishers' policies for Open and FAIR data (Findable, Accessible, Interoperable, Reusable). Submitted data will be registered with Digital Object Identifiers (DOIs) and long-term archived.

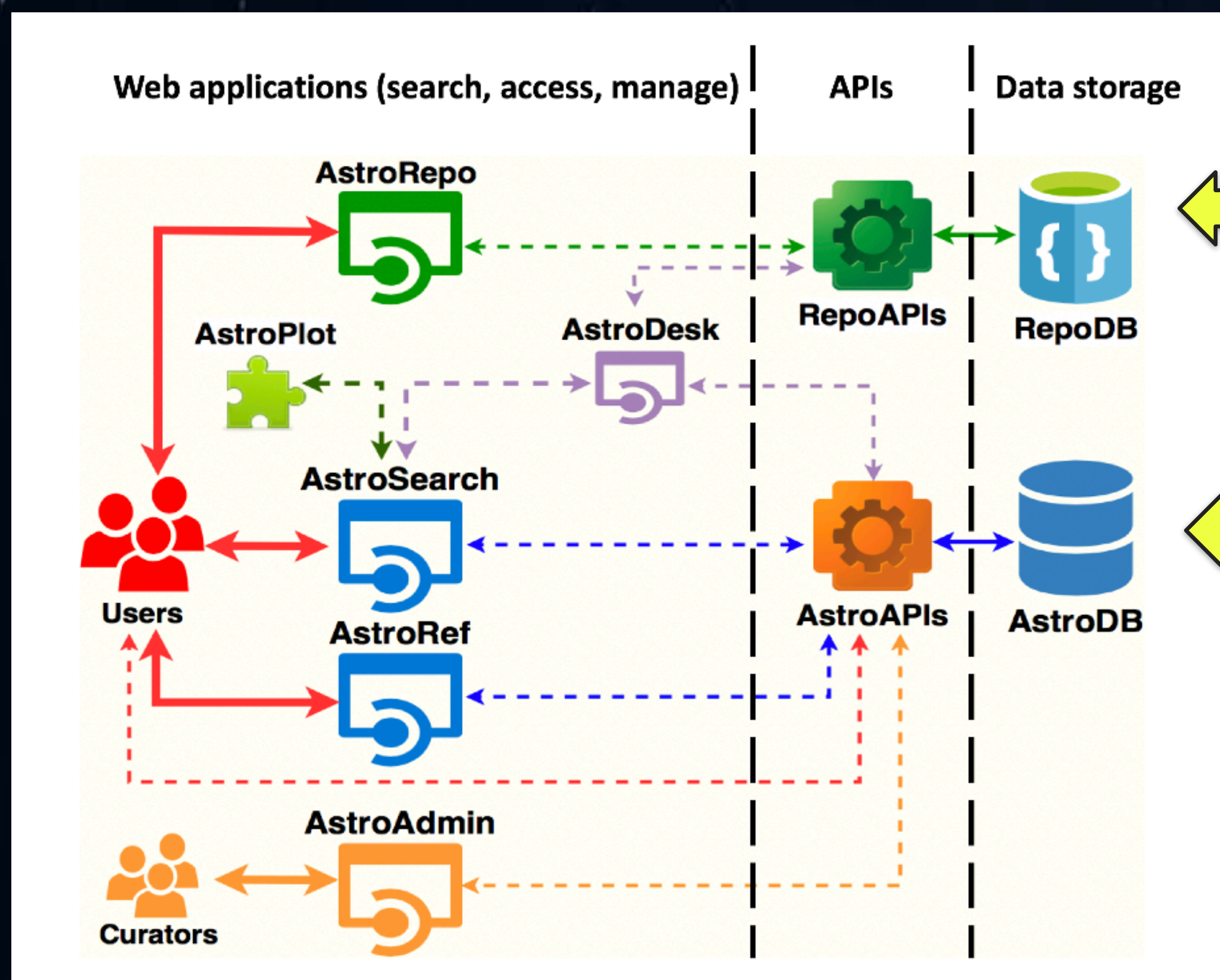
**AstroDB**: Storage database (PostgreSQL) with rich and quality-controlled metadata content (analytical methods, sample lithologies, etc.) that integrates (fuses) data making the data easily searchable and minable as a single data product. AstroDB uses a modified version of the Observation Data Model ODM2. Interfaces to AstroDB include:

- **AstroAPIs**: A suite of Advanced Programming Interfaces (APIs) serves as the bridge between the storage database and all applications that retrieve data from this database. Users can develop their own applications to access data via AstroAPIs.

- **AstroSearch** and **AstroPages** provide interfaces for users to explore the content of AstroDB, select samples and data that they are interested in, view and browse them, and download them in a useful format. Sample type, sample lithology, sample composition, and analytical method are some of the criteria for selecting data. In a later phase of the AstroMat development we will add **AstroPlot**, a suite of tools for interactive visualization of analytical data. Also planned is the capability to visualize in-situ measurements on thin section or microprobe mount images with direct links to the individual spot analyses.

- **AstroRef** is AstroMat's Bibliography module that allows users to browse, search, filter, and sort a comprehensive bibliography of all references related to the JSC collections. The bibliography includes references both with data ingested into the database, and papers without data to provide a valuable reference library to the community.

**AstroAdmin** provides tools for AstroMat data curators to create, curate, organize, annotate, and manage highest quality data and metadata content.



AstroMat is a NASA-funded, state-of-the-art digital data infrastructure for laboratory data generated by the study of extraterrestrial samples curated in NASA's Astromaterials Collections. AstroMat's mission is to maximize the utility and impact of these data for science and education.

The Astromaterials Data System is currently under development. Some features may be available. Please check our [progress](https://www.astromat.org).

Visit the new web site at [www.astromat.org](https://www.astromat.org)

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### Including Present & Future Data

We encourage investigators to contribute their data to AstroMat by submitting it to the AstroRepo for publication and long-term archiving. Funding agencies like NASA and NSF already require Data Management Plans, and AstroMat will be the most suitable repository for laboratory data acquired on astromaterials. Similarly, publishers now require authors to make their data openly and persistently accessible by depositing them in community data repositories that operate according to international best practices. AstroMat will obtain the necessary repository certification (CoreTrustSeal) to fulfill publishers' requirements as a trusted repository.

AstroMat Bibliography Home Filter by Collection Statistics Support a Reference This author: D. Blawie

38 References found in collection "COSMIC DUST".

ANALYTICAL ELECTRON MICROSCOPY OF INTERPLANETARY DUST PARTICLES

ARTICLE published 1988 in LUNAR AND PLANETARY SCIENCE CONFERENCE PROCEEDINGS volume 18 issue NOT PROVIDED on pages 615-622

Status: Data entry not start | 03/16/2019

Identifiers: [DOI:10.1051/1988PS12\\_06\\_0150](https://doi.org/10.1051/1988PS12_06_0150)

Collections: **COSMIC DUST**

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