ESIP Winter Meeting

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The Astromaterials Data System:

A Comprehensive Platform for Preservation, Access, and of Mining Analytical Data of Extraterrestrial Samples

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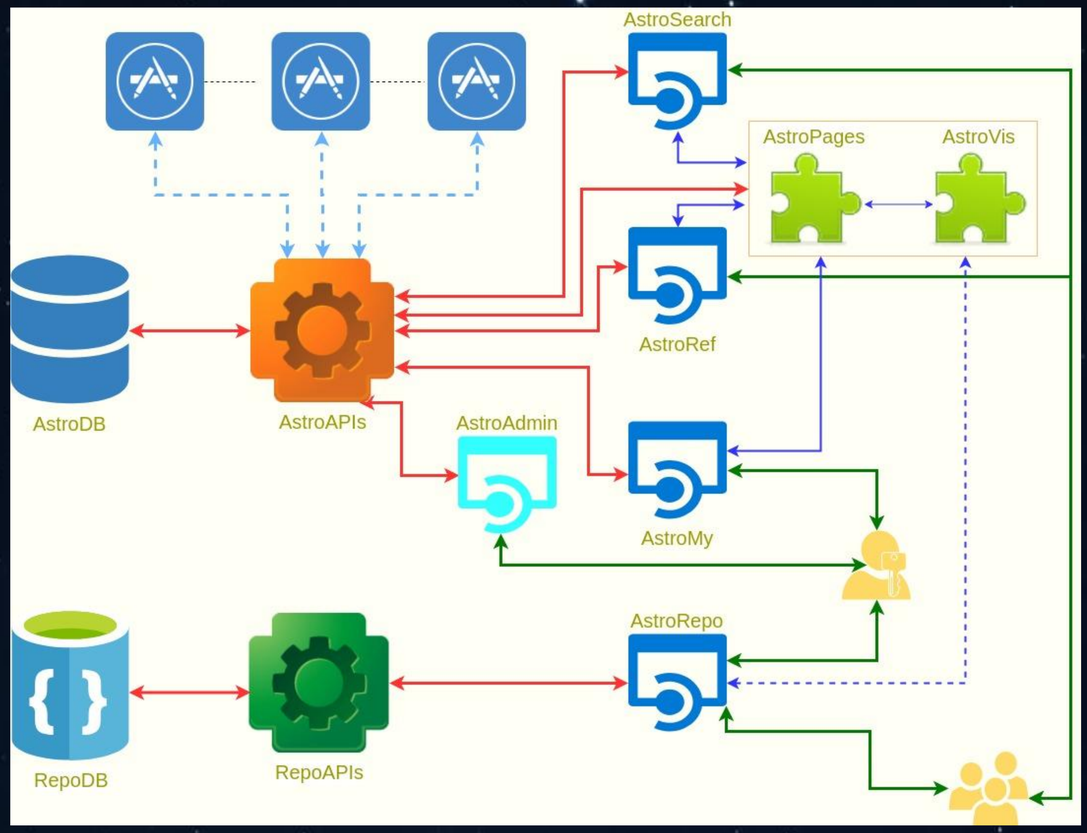
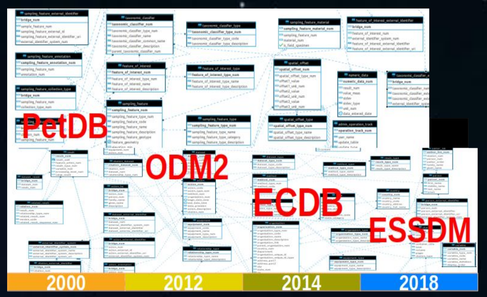
The Astromaterials Data System (**AstroMat**) is a joint project of the Geoinformatics Research Group at the Lamont-Doherty Earth Observatory and NASA's Johnson Space Center (JSC) to develop a comprehensive data system that supports discovery, access, preservation, and analysis of analytical data generated by the study of extraterrestrial materials curated by JSC's Astromaterials Acquisition and Curation Office, including lunar samples, meteorites, cosmic and interplanetary dust, solar wind, and other samples. AstroMat continues the NASA-funded MoonDB project, expanding data compilation to all JSC astromaterials collections, refining and augmenting the MoonDB database schema, and upgrading MoonDB applications to provide both integrated and specialized access to the JSC astromaterials collections.

AstroMat is developed as an ecosystem that will help researchers, data curators, and developers track, manage, access, search and explore data and comprises the following components:

- **AstroDB**: Storage database (PostgreSQL) with rich metadata content that integrates (fuses) data previously scattered across the scientific literature and in online PDF documents, making the data easily searchable and minable as a single data product with human and machine-readable interfaces.
- **AstroRepo**: Repository for user-submitted digital content from astromaterials research (analytical data, data synthesis, images, models, etc), will seek CoreTrustSeal certification for Trusted Data Repositories. Includes **RepoDB** as the document database (MongoDB).
- A series of web applications for specific purposes:
  - **AstroAPIs**: serves as a bridge between the storage database and all applications that retrieve data from the AstroDB database.
  - **AstroAdmin**: enables curators to create, curate, organize, annotate, and manage highest quality data content including metadata and analytical data.
  - **AstroSearch**, **AstroRef**, **AstroPages** and **AstroVis** provide interfaces for users to browse and 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.



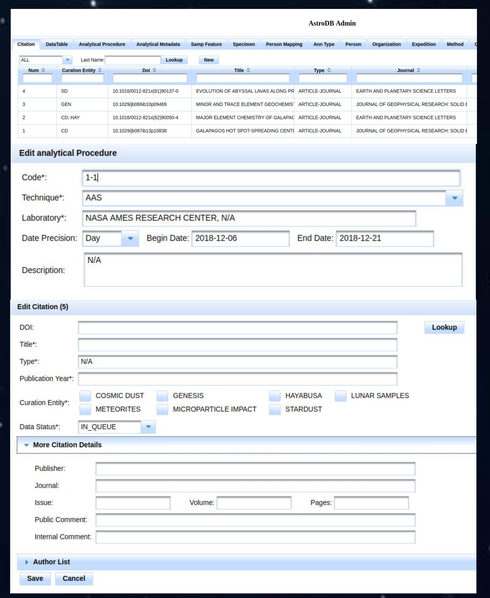


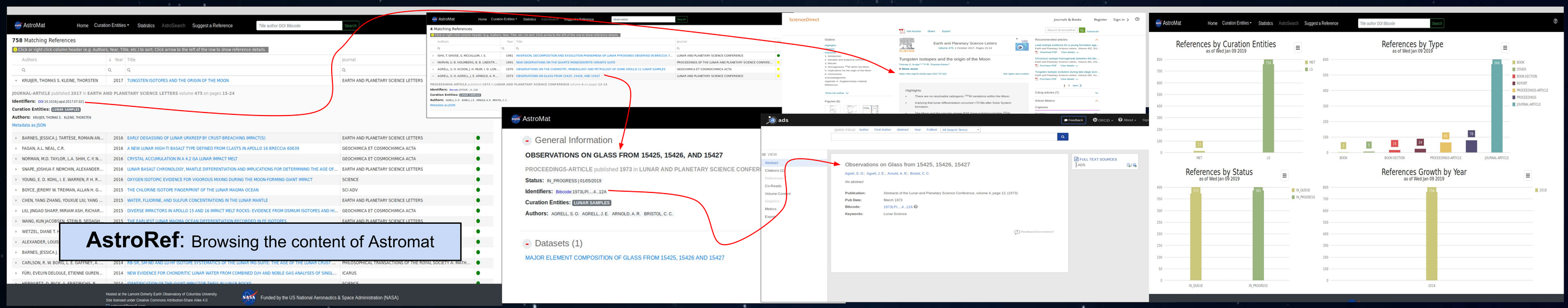
First effort to build chemical and petrological data model for rock samples

Follow Open Geospatial Consortium's (OGC) Observations and Measurements (O&M) standard

Combine PetDB and ODM2, try to model sample based earth chemical data

Evolved from ECDB, an earth and space sample based data model





AstroRef: Browsing the content of Astromat

Hosted at the Lamont-Doherty Earth Observatory of Columbia University.

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