

**ARCHIVING DATA IN THE PDS WITH OLAF.** C. Kingston<sup>1</sup>, E. Palmer, J. Stone, M. Drum, C. Neese, B. Mueller, Planetary Science Institute, 1700 E Ft Lowell Rd, 110, Tucson, AZ, ckingston@psi.edu

**Introduction:** The NASA Planetary Data System (PDS) is a long-term archive of digital data products returned from NASA's planetary missions and ground-based observations. PDS4 is a robust, self-describing information model and creates the foundation of the PDS. Planetary science datasets are archived along with PDS4 labels that describe each data file. The PDS4 labels are constructed such that they are easily searchable and they provide the backbone for a wide array of applications, including enhanced search-ability across planetary datasets.

The commitment to support all mission and ground-based observation data has made PDS4 a challenging standard for data providers to learn when it comes time to archive data.

**The Process:** Rather than forcing data providers to write their own PDS4 product labels in XML, OLAF uses the data and its corresponding metadata to generate the labels automatically.

The required metadata is typically supplied in a separate keyword-value table that describes a single data file or a batch of data files with the same definitions. However, data providers can submit CSV tables with this metadata embedded directly into the top of the file. OLAF generates useful template files that data providers can use to submit the required PDS4 keyword values without having to learn how OLAF expects such files to be formatted.

OLAF uses the metadata it collects to generate consistent, PDS4-compliant XML labels for every data product and supporting document and organizes them, along with the data products that they describe, into an archive package. This method ensures that a data provider can focus on providing details about

what they know best rather than learning the details of PDS4 or how to write valid XML.

Once the archive package is fully prepared, the PDS node representative coordinates an external peer review so that the dataset can be reviewed, archived, and made available to the public.

**Goals:** The PDS archive is most useful when it collects data that is thoroughly described and documented. Thus, the underlying philosophy of OLAF is to make submitting data to the PDS easy so that data providers produce more useful data. OLAF makes submitting data to the PDS easy by:

- simplifying PDS4 label generation.
- isolating users from PDS4 jargon.
- generating template files for required metadata.
- subjecting all data to a peer-review process.
- supporting several common data types.

**Data Types:** In order to make OLAF useful to as many data providers as possible, the application supports the following data types.

- CSV Tables
  - OLAF includes the capability to upload tabular data as Comma-Separated Values (CSV) files. The use of CSV files for tabular data allows users to use spreadsheet software like Microsoft Excel to generate data files. OLAF supports two methods for uploading data and the required metadata: providing the data and metadata as separate CSV files, or by embedding the metadata in the corresponding data files themselves. These two methods allow data providers the flexibility to choose which approach is appropriate depending on their specific circumstances.

- FITS Images
  - Flexible Image Transport System (FITS) is an open standard defining a digital file format useful for storage and transmission of data. FITS images include a header with metadata keywords and definitions that are also required by PDS4. OLAF makes use of these FITS keywords by mapping them to corresponding PDS4 keywords; any additional PDS4 keyword definitions can be supplied in a separate CSV file.
- Generic 2D Array Images
- Fixed-Width Tables
- Multipart Tables (Under Development)

**Context Products:** A special category of PDS4 products, context products provide a way to associate the digital material in an archive with a physical object. Examples include missions, spacecraft, instruments, laboratories, observatories, telescopes, planetary bodies, references to papers, etc. Context products are managed by PDS so that all data providers can access and use the same material.

OLAF includes a useful interface for discovering existing PDS4 context products because one must be included in every product label (therefore, it must be described in the required metadata). Since most data products in an archive package will share context products, OLAF includes support for saving and nicknaming context products as “Bookmarks” for easy reference.

**Ongoing Development:** OLAF is maintained by the PDS Small Bodies Node (SBN). Decisions regarding development of new features is primarily driven by the needs of the planetary science/small bodies community. The OLAF development team is currently focused on providing support for additional data types.

OLAF is currently available at <https://sbnapps.psi.edu/olaf-node>. For more information, visit <https://olaf.psi.edu> or contact [olaf@psi.edu](mailto:olaf@psi.edu).