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The European Space Agency's Planetary Science Archive (PSA)

D. Heather, M. Barthelemy, S. Martinez, J.L. Vazquez, M. Szumlas, C. Arviset, P. Osuna and the PSA Development Team
European Space Agency, ESAC, Villafranca del Castillo, 28080 Madrid, Spain
(dheather@rssd.esa.int)

Abstract

The Planetary Science Archive (PSA), available at http://archives.esac.esa.int/psa, represents the central repository for all science data returned by ESA's planetary missions. PSA provides support for data producers and end users of the data, aiming to maximize its long-term usability and access after the mission itself is complete. The repository contains data from all of ESA's planetary explorers, from Giotto through to the ongoing Mars Express, Venus Express and Rosetta missions.

1. The Planetary Science Archive

Scientific and engineering data from ESA's planetary missions are made accessible to the world-wide scientific community via the Planetary Science Archive (PSA). The PSA consists of online services incorporating search, preview, download, notification and delivery basket functionality. Besides data from the GIOTTO spacecraft and several ground-based cometary observations, the PSA contains data from the Mars Express, Venus Express, Rosetta, SMART-1 and Huygens missions.
The focus of the PSA activities is on the long-term preservation of data and knowledge from ESA's planetary missions.

1.1 Data Preparation and the PDS Standards

All data in the PSA are prepared by the corresponding instrument teams, mostly located in Europe. PSA supports the instrument teams in the full archiving process, from the definition of the data products, meta-data and product labels through to validation and ingestion of the products into the archive.

All data in the PSA are compatible with the Planetary Data System (PDS) Standard of NASA, and the PSA staff work in close collaboration with the PDS staff.
To ensure a common archiving approach for all of ESA's planetary missions as well as to provide a similar data quality and standard for end users, a tool has been developed supporting the instrument teams in syntactically validating their datasets before delivering to the PSA. This tool, and the overall archiving process is being streamlined in line with the re-development of the science ground segment for Rosetta. This will be very important for the efficient handling and release of data during Rosetta's encounter with the comet Churyamov-Gerasimenko.

2. User Interfaces

Scientific users can access the data online using several interfaces:
The Advanced Search Interface (Figure 1) allows complex parameter based queries, providing the end user with a facility to complete very specific searches on meta-data and geometrical parameters. By nature, this interface requires careful use and heavy interaction with the end-user to input and control the relevant search parameters.

The Map-based Interface (Figure 2) is currently operational only for Mars Express HRCS and OMEGA data. This interface allows an end-user to specify a region-of-interest by dragging a box onto a base map of Mars. From this interface, it is possible to directly visualize query results. The Map-based and Advanced interfaces are linked and cross-

compatible. If a user defines a region-of-interest in the Map-based interface, the results can be refined by entering more detailed search parameters in the Advanced interface.

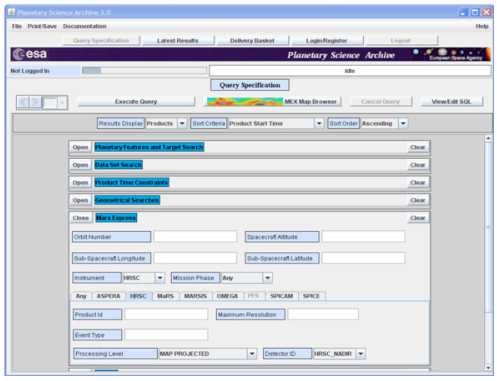

Figure 1: Screenshot of the PSA Advanced Search Interface.

The FTP Browser Interface is designed for more experienced users, and allows for direct browsing and access of the data set content through ftp-tree search. Each dataset contains documentation and calibration information in addition to the scientific or engineering data.

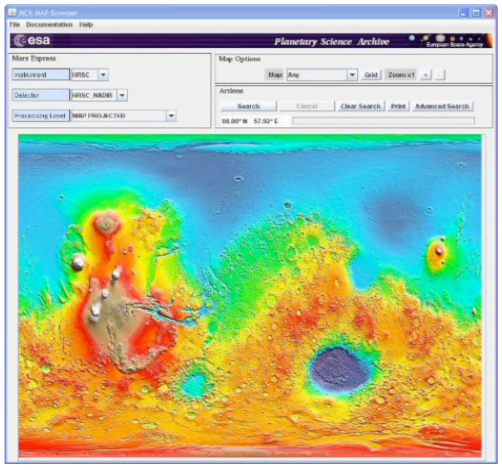

Figure 2: Screenshot of the PSA Map-based Search Interface (for HRSC and OMEGA on Mars Express).

3. PSA Development and IPDA

A PSA advisory body will soon be established in order to assess the continuing development of the PSA. The advisory panel will aim to meet regularly, reviewing the progress on defined requirements and providing feedback on our activities.

New areas of data exploitation include attempts to standardize the way in which planetary data sets are constructed internationally. This is driving towards 'interoperability' of the data systems maintained at all Agencies archiving planetary data, and it is hoped that in the long-run any data can be obtained from any of the co-operating archives using the same protocol. Representatives from most major archiving agencies are members of the International Planetary Data Alliance (IPDA), and regular meetings are now taking place as standards are discussed.

6. Summary

The Planetary Science Archive (PSA) contains all science data from ESA's planetary missions, made available to users via several interfaces. The archive strives to provide long term access to all data in formats that allow for their use internationally. Data are currently available from Giotto, Huygens, SMART-1, Mars Express, Venus Express and Rosetta, and it is planned to include BepiColombo data in future.

Development continues towards providing more automated access to all data holdings internationally, and to improved standardization of archiving materials / procedures via the IPDA.

You can access the PSA via the following URL:

http://archives.esac.esa.int/psa