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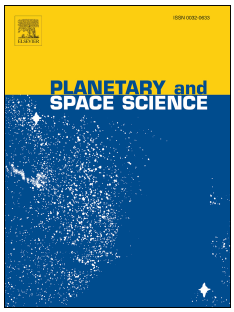


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# Improving Accessibility and Discovery of ESA Planetary Data Through the New Planetary Science Archive

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**Abstract**

The Planetary Science Archive (PSA) is the European Space Agency's (ESA) repository of science data from all planetary science and exploration missions. The PSA provides access to scientific datasets through various interfaces at `http://psa.esa.int`. All data sets are scientifically peer-reviewed by independent scientists, and are compliant with the Planetary Data System (PDS) standards.

Mostly driven by the evolution of the PDS standards which all new ESA planetary missions shall follow and the need to update the interfaces to the archive, the PSA has undergone an important re-engineering. In order to maximise the scientific exploitation of ESA's planetary data holdings, significant improvements have been made by utilising the latest technologies and implementing widely recognised open standards. To facilitate users in handling and visualising the many products stored in the archive which have spatial data associated, the new PSA supports Geographical Information Systems (GIS) by implementing the standards approved by the Open Geospatial Consortium (OGC). The modernised PSA also attempts to increase interoperability with the international community by implementing recognised planetary science specific protocols such as the PDAP (Planetary Data Access Protocol) and EPN-TAP (EuroPlanet-Table Access Protocol).

In this paper we describe some of the methods by which the archive may be accessed and present the challenges that are being faced in consolidating data sets of the older PDS3 version of the standards with the new PDS4 deliveries into a single data model mapping to ensure transparent access to the data for users and services whilst maintaining a high performance.

*Keywords:* Planetary Science; ESDC; Archive; Interoperability; Virtual Observatory; GIS; European Space Agency; PDS.

## 1. Introduction

The Planetary Science Archive (PSA) is the European Space Agency's (ESA) repository of science data from all planetary science and exploration missions. The PSA provides access to scientific datasets through various interfaces at `http://psa.esa.int`. All datasets are scientifically peer-reviewed by independent scientists, and are compliant with the Planetary Data System (PDS) standards.

In April 2016 the first of the ESA planetary missions, ExoMars2016, started to deliver data to the PSA (Lim (2015)) using the most recent release of the Planetary Data System standards (PDS4) (Planetary Data System (2016b)). Largely driven by the changes this signified to the archive, the opportunity was taken to undergo a complete re-engineering of the PSA in order to increase the accessibility of ESA's planetary data holdings utilising the latest technologies and to significantly improve the user experience for both the specialist scientific community and the general public alike.

Compatibility with the earlier planetary missions following the PDS3 specification (Planetary Data System (2009)) has been maintained by mapping the key meta-data of the data stored in the archive into a common data model with the intention of providing transparency to the services that make up the new PSA, and consequently to the end user. On top of this model the newly designed PSA includes a better integration with Planetary GIS (Geographical Information Systems) analysis tools and support for recognised Planetary interoperability services such as the PDAP (Planetary Data