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Research Infrastructure

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Deliverable D7.3

Deliverable Title:	Report on extended Planetary Science support in Aladin beta
Due date of deliverable:	31/05/2022
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Document status:	Final

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Co-ordinator:	Prof Nigel Mason, University of Kent

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1. **Nature:** R = Report, P = Prototype, D = Demonstrator, O = Other

2. **Dissemination level:**

PU	PP	RE	CO
Public	Restricted to other programme participants (including the Commission Service)	Restricted to a group specified by the consortium (including the Commission Services)	Confidential, only for members of the consortium (excluding the Commission Services)

Executive Summary / Abstract:

This deliverable concerns the adaptation of the VO Aladin Desktop tool for planetary science data.

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1   Introduction & Overview of Progress

Aladin Desktop is a tool developed by Centre de Données astronomiques de Strasbourg (CDS) originally intended for displaying celestial surveys and tabular data from missions and literature. It is compatible with most VO standards (data discovery, access, display, comparison and processing).

Objective

The objective is to adapt the Aladin Desktop tool to manage both celestial and planetary data. To do this, it is essential to be able to distinguish and manipulate specifically the various spatial reference systems (celestial, Martian, Venusian, etc.). Since Aladin is based on International Virtual Observatory Alliance (IVOA) standards, this adaptation necessarily requires an extension of these standards to support these new spatial references. While waiting for the planetary extensions of these IVOA standards, this deliverable is made as prototype version (beta version up to v11.122) of Aladin Desktop freely available on the Aladin CDS site of the Astronomical Strasbourg Observatory : https://aladin.cds.unistra.fr. The final version of the deliverable will be integrated into the next official public version v12 available from June 2022.

### Explanation of the work carried in WP

Display function

Implemented from version 11.122, Aladin specifically distinguishes and manipulates different spatial reference systems, not just celestial ones. This new capability allows it to adapt its display functions to the planet or sky concerned and to prevents inappropriate projections.

Planetary MOCs

Based on a proposed extension of the IVOA MOC standard dedicated to planetary coverage, Aladin version 11.122+ specifically handles planetary MOCs. This extension is based on an upgrade of the MocJava library, developed by the CDS and integrated both in Aladin and in the MocServer (v5.10). Deployed at the CDS, the MocServer provides the functions for handling a collection of MOCs. It is used as a "back-end" service by Aladin => https://alasky.cds.unistra.fr/MocServer/query

Discovery functions

This new release of Aladin is able to query the IVOA directory services for planetary data (EPN-core compatible, and planetary HiPS) in the form of a new branch ("Solar System") of the Aladin resources tree. Based on the new MOC library compatible with planetary coverages (see previous point), Aladin 11.122+ is capable of dynamically filtering data whose planet (or sky) is compatible with the current subject of study.
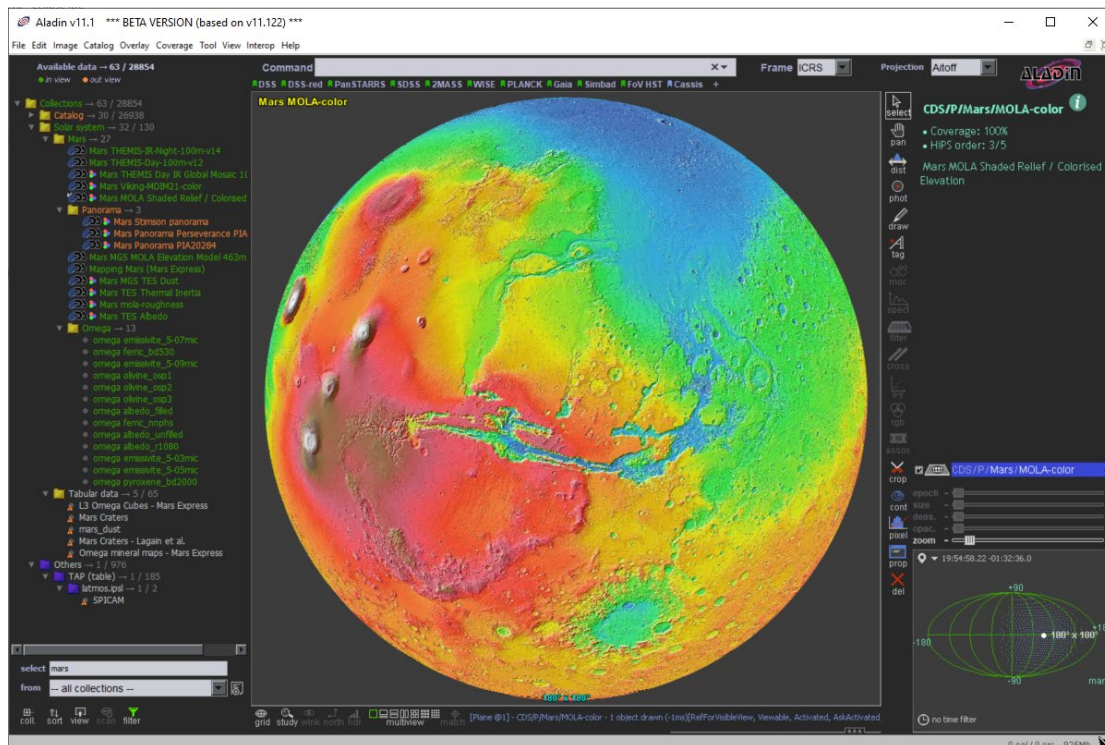
Aladin Desktop supporting planetary space references and filtering of available compatible resources (left side discovery tree)

Data cube manipulation by interaction with CASSIS

This new version of Aladin has been adapted to work in combination with IRAP's CASSIS software (plugin mechanism). These developments allow the exploitation of planetary data cube by spatial extraction of spectra (polygon, circle, point) for transfer and analysis by CASSIS.