



## ▶ Planetary Data Systems (PDS) Imaging Node Atlas II

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The Planetary Image Atlas (PIA) is a Rich Internet Application (RIA) that serves planetary imaging data to the science community and the general public. PIA also utilizes the USGS Unified Planetary Coordinate system (UPC) and the on-Mars map server.

The Atlas was designed to provide the ability to search and filter through greater than 8 million planetary image files. This software is a three-tier Web application that contains a search engine backend (MySQL, JAVA), Web service interface (SOAP) between server and client, and a GWT Google Maps API client front end. This application allows for the search, retrieval, and download of planetary images and associated meta-data from the following missions:

2001 Mars Odyssey, Cassini, Galileo, LCROSS, Lunar Reconnaissance Orbiter, Mars Exploration Rover, Mars Express, Magellan, Mars Global Surveyor, Mars Pathfinder, Mars Reconnaissance Orbiter, MESSENGER, Phoenix, Viking Lander, Viking Orbiter, and Voyager.

The Atlas utilizes the UPC to translate mission-specific coordinate systems into a unified coordinate system, allowing the end user to query across missions of similar targets. If desired, the end user can also use a mission-specific view of the Atlas. The mission-specific views rely on the same code base.

This application is a major improvement over the initial version of the Planetary Image Atlas. It is a multi-mission search engine. This tool includes

both basic and advanced search capabilities, providing a product search tool to interrogate the collection of planetary images. This tool lets the end user query information about each image, and ignores the data that the user has no interest in. Users can reduce the number of images to look at by defining an area of interest with latitude and longitude ranges.

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*This software is available for commercial licensing. Please contact Dan Broderick at [Daniel.F.Broderick@jpl.nasa.gov](mailto:Daniel.F.Broderick@jpl.nasa.gov). Refer to NPO-47820.*

## ▶ Automatic Calibration of an Airborne Imaging System to an Inertial Navigation Unit

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This software automatically calibrates a camera or an imaging array to an inertial navigation system (INS) that is rigidly mounted to the array or imager. In effect, it recovers the coordinate frame transformation between the reference frame of the imager and the reference frame of the INS.

This innovation can automatically derive the camera-to-INS alignment using

image data only. The assumption is that the camera fixates on an area while the aircraft flies on orbit. The system then, fully automatically, solves for the camera orientation in the INS frame. No manual intervention or ground tie point data is required.

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*This software is available for commercial licensing. Please contact Dan Broderick at [Daniel.F.Broderick@jpl.nasa.gov](mailto:Daniel.F.Broderick@jpl.nasa.gov). Refer to NPO-48755.*

## ▶ Translating MAPGEN to ASPEN for MER

**Faithful translation is achieved from mixed-domain representations into the ASPEN Modeling Language.**

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This software translates MAPGEN (Europa and APGEN) domains to ASPEN, and the resulting domain can be used to perform planning for the Mars Exploration Rover (MER). In other words, this is a conversion of two

distinct planning languages (both declarative and procedural) to a third (declarative) planning language in order to solve the problem of faithful translation from mixed-domain representations into the ASPEN Modeling Language.

The MAPGEN planning system is an example of a hybrid procedural/declarative system where the advantages of each are leveraged to produce an effective planner/scheduler for MER tactical planning. The adaptation of the