

Twelve Experiments, One Goal: Archive Usable Science Data for the Cassini Mission to Saturn

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The Cassini Mission to Saturn is a major mission because it will expand our understanding of the Saturn system. Archiving the data returned from this mission in a usable form is critical to our future scientific understanding of this remarkable system and our solar system. The task requires significant resources, development of critical timelines, and management of instrument teams who were individually selected and are operating distributed around the world. To help ensure data from this mission can be used by future scientists it was important that instrument teams understand the Planetary Data System (PDS) standards as early as possible so that the operational cost of archiving data with the PDS was understood and planned for. It was equally important that PDS communicate requirements to the instrument teams and that PDS understood the volume and types of data returned by instruments so they could plan for the operations of archiving, preserving, and distributing this data to the science community. This paper will address the activities the Cassini project has focused on in pursuit of developing a usable science data archive. Five aspects of archiving will be discussed:

DOCUMENTATION of the mission, spacecraft, instruments and data sets - a detailed history of the mission and full description of the capabilities is required,

STANDARDIZATION of data formats - to assure long-term access, data formats should be as simple as possible,

PRESERVATION of navigation and calibration - retrieval of pointing information and calibration should be planned early and accomplished in a monitored incremental process,

VALIDATION of data products – the highest quality data validation is best accomplished when the data products are distributed to the science team in their archive form,

OPTIMIZATION for correlative studies - coordination among experiments to assure correlative studies are supported by defining standards for data products and documentation.

With NASA's current two decadal schedule of recurring visits to the individual outer planets these steps are necessary to assure access of the data by future users. A reliable Cassini archive will support a data analysis program, allow comparisons of the saturnian system with the jovian system (the Galileo and JIMO missions) and provide a basis for future mission planning.