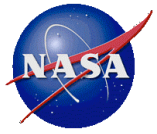

International Planetary Data Alliance: Introduction and Background

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Background -- Planetary Data System

- Scientific community in the U.S. decided in the eighties to setup a data system for planetary related data (ground-based, laboratory data, space data)
  - Called the *Planetary Data System (PDS)*
  - Contains *peer reviewed* data managed by scientists at discipline nodes
  - Archives data compliant to a data standard (*PDS-Standard*)
  - Maintains and distributes data to the world-wide scientific community

- NASA requires NASA-funded planetary science missions and instruments to archive their data in the PDS using the PDS data standard

Background -- Planetary Science Archive

- Scientific community in Europe got acquainted to the PDS-Standard, as most data originated from NASA missions
  - ESA's first planetary mission (GIOTTO) was archived using the PDS-Standard, actually it was archived by the PDS-Small Bodies Node
  - ESA adopted the PDS-Standard as the base standard for it's archival system, the Planetary Science Archive (PSA)
    - Now containing data from Giotto, Mars Express, Huygens, ground-based observations and soon Rosetta, Smart1 and Venus Express.
    - Exploration missions likely to use same standard, e.g. ExoMars will archive using the PSA

PDS-PSA Cooperation

- NASA/PDS and ESA/PSA have worked closely together to coordinate archiving activities for current missions (e.g., Huygens, Mars Express, Venus Express)

- Recently PSA and PDS have started collaborating on a broader strategy to interoperate in order to:
  - Give scientific communities world-wide access and services to data archives built from similar standards
  - Reduce cost of archiving and distributing science data by collaborating and sharing standards
  - Ensure reusability of science data across agency/mission/instrument boundaries
  - Coordinate archiving processes and plans
  - Improve and increase services offered

Incentive

- Other space agencies need to setup similar archival systems, including standards, tools, services, etc in the coming years to serve 'their' scientific community
  - Co-operations make it necessary to minimize the differences between systems and standards, e.g. Rosetta (NASA,ESA), Bepi-Colombo (ESA,JAXA), Chandrayaan (ISRO,ESA), …
  - Share lessons learned across agencies and archiving efforts
  - Avoid re-inventing the wheel - if not explicitly wanted
- World-wide scientific communities want to have standardized archival systems
  - Scientific community not bound to any one agency
  - They (often) do not care about Space Agency's considerations
  - Demand for new, sophisticated services and tools
- Concerns in accepting data standards fully controlled by sister agency

Internationalization I -- Sharing
PDS-PSA Archival Co-operation

- The PDS and PSA share archiving standards that are currently managed by the PDS including
  - Common mechanisms for organizing and documenting planetary science archives
  - A standard data dictionary defining common keywords and values for “labeling” data products

- The PDS and PSA share the following references on archiving standards and processes maintained by PDS, including
  - Quick Guide to Archiving: http://pds.nasa.gov/documents/qs/index.html
  - PDS Standards Reference: http://pds.nasa.gov/documents/sr/index.html
  - Archive Preparation Guide: http://pds.nasa.gov/documents/apg/apg.pdf

- PSA has standing invitation to PDS Standard Teleconferences and Council Meetings
  - PSA is attending once a year to a Council Meeting
  - PSA is joining in to teleconferences from time to time

Internationalization II -- Interoperability
Standards for Data Access and Distribution

- In 2005, the PSA and PDS initiated an effort to develop common interoperability standards for accessing and distributing data internationally from national planetary science archives this includes
  - A *protocol* for finding, accessing and retrieving science products from across agency systems
  - Common semantics for discipline-specific queries
- The plan is that joint missions in the future will use the interoperability protocol rather than submitting and archiving data from another agency in a local system

Internationalization III -- *The Future*
Formation of an International Alliance

- In an effort to move towards greater collaboration, ESA and NASA are interested in internationalizing the archiving standards and interoperability standards by:
  - Formulating an organization to manage the planetary science data standards called the International Planetary Data Alliance (IPDA)
  - Inviting stakeholders from international agencies to participate in the IPDA by supporting definition and adoption of the standards
  - Participating in the sharing of planetary science data using the same data standard and allow data exchange via the interoperability protocol
  - Working to minimize the cost of adoption on any one agency

- As an example, ESA will share data from the Venus Express mission using the interoperability protocol