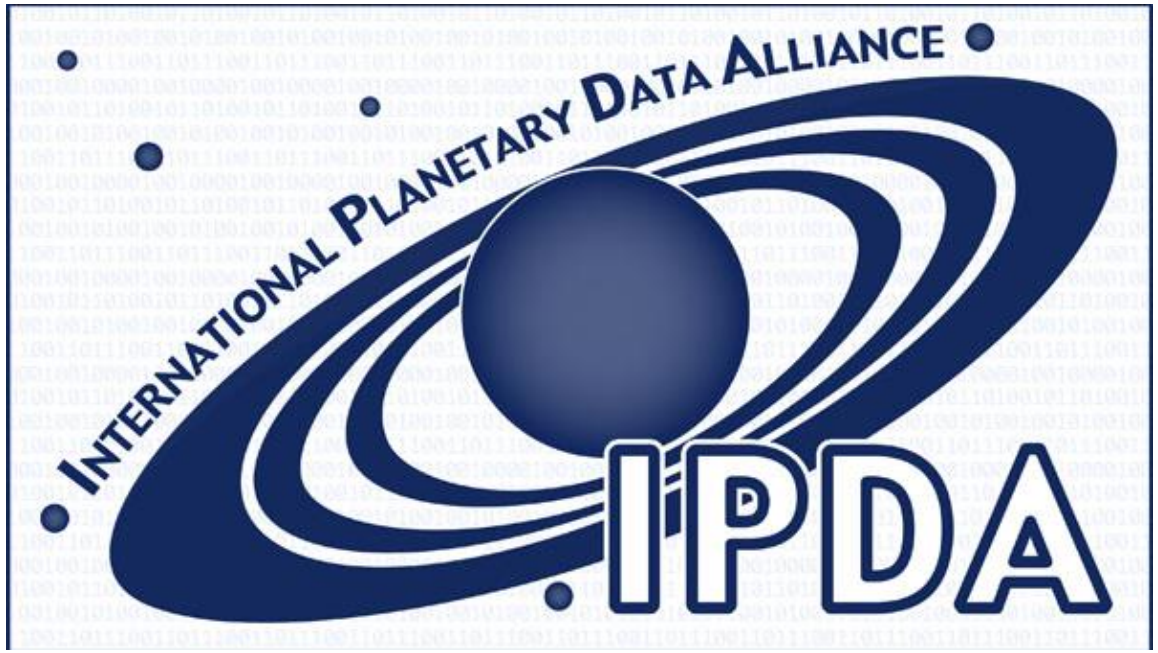
State of the IPDA 2019

Christophe Arviset, Chair

Yukio Yamamoto, Deputy Chair



International Planetary Data Alliance

- Overview
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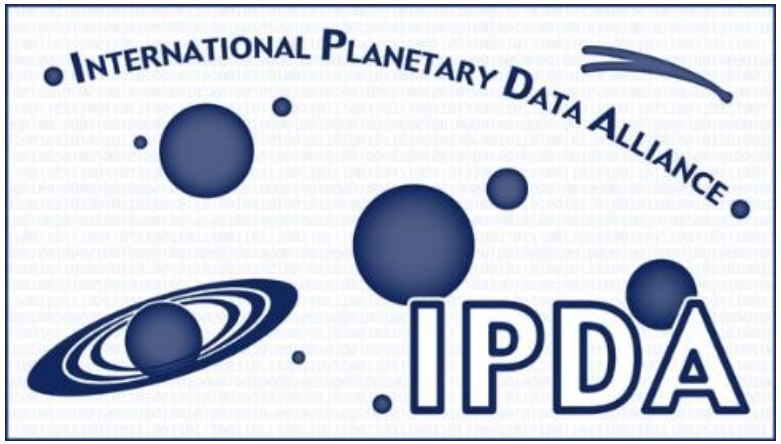
Overview



The International Planetary Data Alliance (IPDA) is a close association of partners with the aim of improving the quality of planetary science data and services to the end users of space based instrumentation.

https://planetarydata.org

Mission and goals

The specific mission of the IPDA is to facilitate global access to, and exchange of, high quality scientific data products managed across international boundaries.

Goals:

- Support construction of compatible archives.
- Support sharing of tools and software services.
- Facilitate global access to, and exchange of, high quality scientific data products managed across international boundaries.

Origin

The IPDA was formed in 2006 with the purpose of adopting standards and developing collaborations across agencies to ensure data is captured in common formats. It has grown to approximately twelve agencies represented by a number of different groups through the IPDA Steering Committee.

IPDA member agencies

Armenian Astronomical Society (ArAS)
China National Space Administration (CNSA)
European Space Agency (ESA)
Finnish Space Agency
German Aerospace Center (DLR)
Indian Space Research Organization (ISRO)
Italian Space Agency (ASI)
Japanese Aerospace Exploration Agency (JAXA)
Korea Astronomy and Space Science Institute (KASI)
National Air and Space Administration (NASA)
National Centre for Space Studies (CNES)
Russian Space Research Institute (IKI)
United Arab Emirates Space Agency
UK Space Agency (UKSA)

Steering Committee

- The IPDA Steering Committee oversees the execution of projects and coordinates the international collaboration.
- Maximum of two representatives per member agency.
- Chair and deputy chair are selected for two-year terms from the Steering Committee members.

Technical Advisory Group

- Representatives from member agencies who assist in refining and accomplishing defined IPDA goals.
- Deeply involved in IPDA projects and a critical to project success.

General activities

- Meetings
  - Annual meeting
  - Teleconference 2 to 3 times per year
- Projects
  - The IPDA conducts a number of focused projects to enable interoperability, construction of compatible archives, and the operation of the IPDA as a whole.
  - These projects have helped to establish the IPDA and moved the collaboration forward.
  - A key project that is being executed is the implementation of PDS4 (Planetary Data System) data standard.
- Collaboration focus with other agencies
  - PDS and the IPDA collaboration
  - The IVOA and the IPDA collaboration

Steering Committee annual meeting discussion

- Significant discussions/plans for PDS4 release
- Significant discussions for PDAP and other access protocols
- Continued emphasis on sharing tools/software
- Registering and accessing data from other space agencies
- Discussion on international peer reviews
- New/missing projects
- Outreach

Projects and progress

Active projects 2018-2019

- Develop process and coordinate outreach and engagement within IPDA to other agencies
- Develop plan for smallsat/cubesat community engagement with IPDA
- PDS4 Implementation Plan
- Data Access Protocol
- Registry/Search
- IVOA-IPDA
- Data User Services White Paper

Project focus areas 2019-2020

- PDS4 implementation and coordination across agencies
  - Ensure alignment between IPDA and NASA's PDS4 standards and tools working groups
  - Drive compatible archives
- Data Services Architecture development to drive a planetary data ecosystem
- Development and coordinating of planetary APIs
  - Following Data Services Architecture
  - Building on existing work search protocols (PDAP, EN-TAP Planetary Search API)
- Collaboration with other alliances including IVOA

Progress

- Goal: Support construction of compatible archives
  - IPDA endorsed SPICE for capturing ancillary data and improving interoperability among planetary science archives in 2010.
  - IPDA endorsed PDS4 as the archiving standard for planetary data in 2012. Members continue as active participants in development and coordination of the PDS4 standard.
  - IPDA recommended content of the archiving component of an MOU for international missions in 2016.
  - Implementation (or planned implementation) of common PDS4 archive standards across agencies for mission archiving involve the following agencies: ESA, IKI, ISRO, JAXA, KARI, NASA, UAE.

Progress

- Goal: Support sharing of tools and software services
  - Sharing of tools between agencies has increased with PDS4. For example, the PDS4 validation tool is used by several IPDA members, resulting in improved interoperability of data between agencies and robust testing the tool itself.
  - Tool Registry that acts as a virtual clearinghouse of planetary data-related tools produced by a variety of providers worldwide.

Progress

- Goal: Facilitate global access to, and exchange of, high quality scientific data products managed across international boundaries
  - Previous IPDA projects demonstrated interoperability between member agencies. At present, REST based access services are in place between ESA, ISRO, and NASA.
  - High level search between ESA and NASA is in place.
  - Projects are underway to develop citation linkage with publications and to create bridges between IPDA and the IVOA (International Virtual Observatory Alliance).

Missions and data providers adopting PDS4

- ESA – European Space Agency
  - ExoMars Trace Gas Orbiter
  - ExoMars Rover and Surface Platform (with IKI)
  - BepiColombo
  - Juice
- ISRO – Indian Space Resource Organization
  - Chandrayaan-2
- JAXA - Japan Aerospace Exploration Agency
  - Hayabusa-2
  - BepiColombo
- KARI - Korea Aerospace Research Institute
  - KPLO (Korea Pathfinder Lunar Orbiter)
- UAE – United Arab Emirates
  - HOPE, or Al-Amal
- NASA - National Aeronautics and Space Administration
  - LADEE (Lunar Atmosphere and Dust Environment Explorer)
  - MAVEN (Mars Atmospheric and Volatile EvolutioN)
  - OSIRIS-REx (Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer)
  - InSight (Interior exploration using Seismic Investigations, Geodesy and Heat Transport)
  - Mars 2020 Rover
  - Europa Clipper
  - Lucy
  - Psyche
  - Providers of higher order data products (~100)
  - Conversion of PDS3 legacy data

Outreach

Outreach and networking

- IPDA has formal and informal representation at numerous conferences, meetings, and workshops.
  - AGU
  - COSPAR
  - DPS
  - EPSC
  - IVOA
  - LPSC
  - Planetary Data Workshop
  - PSIDA
  - PV

Conclusion

Conclusion

The IPDA has made significant progress in the adoption of common standards, the development of compatible archives, and the establishment of open access policies.

The efforts of IPDA, in working together, led to a common standard realized through the shared development of PDS4.

Based on PDS4 progress, the IPDA sees discoverability, seamless access to data holdings, and increased tool support for using high quality peer reviewed data across international archives as key foci for the future of the IPDA.