# PDS Imaging Node
# FY12 Mid-Year Report

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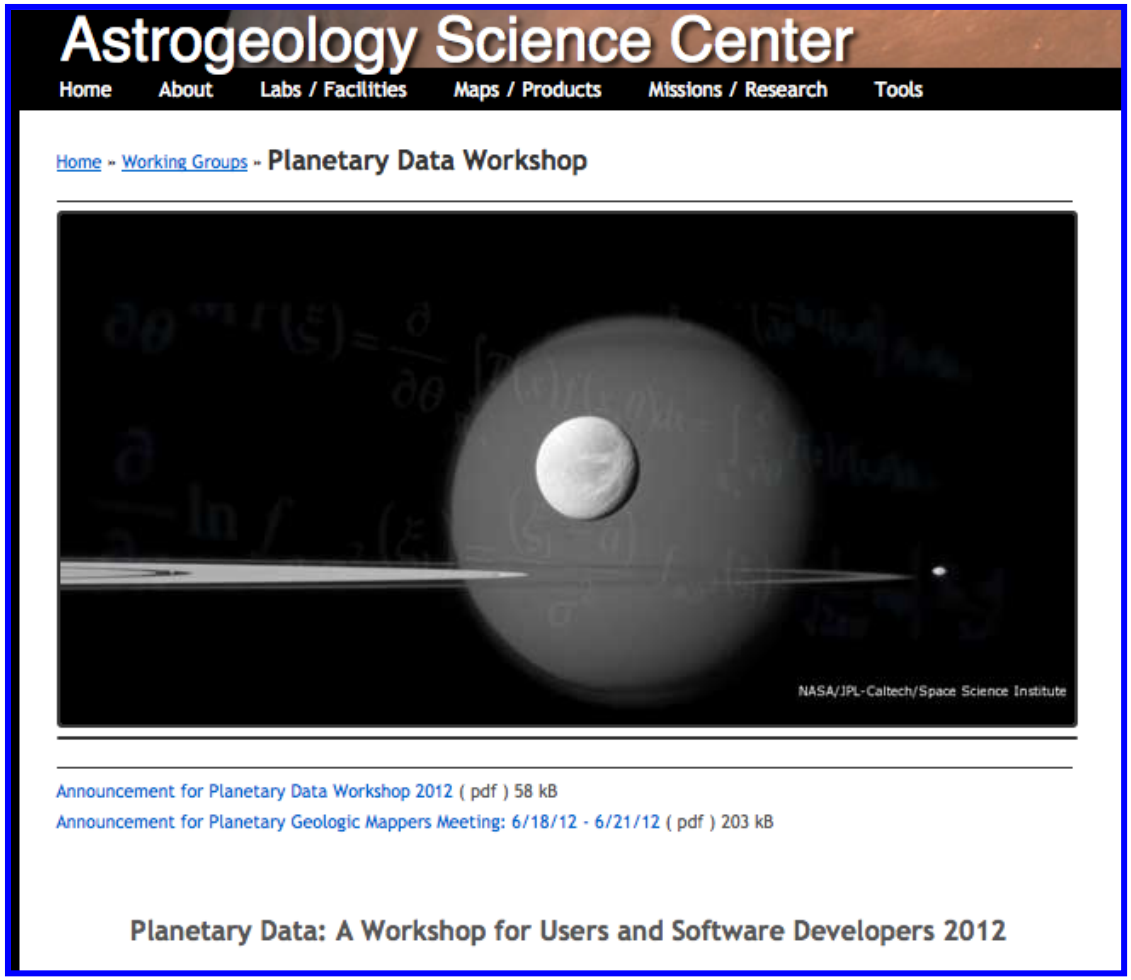
March 27, 2012
PDS Management Council Meeting
College Park, MD

# Outreach: Planetary Data Workshop




**June 25-29, 2012**

**Northern Arizona University (NAU)**

**Flagstaff, AZ**

**Cosponsored by PDS, Carto Program, RPIF Network**

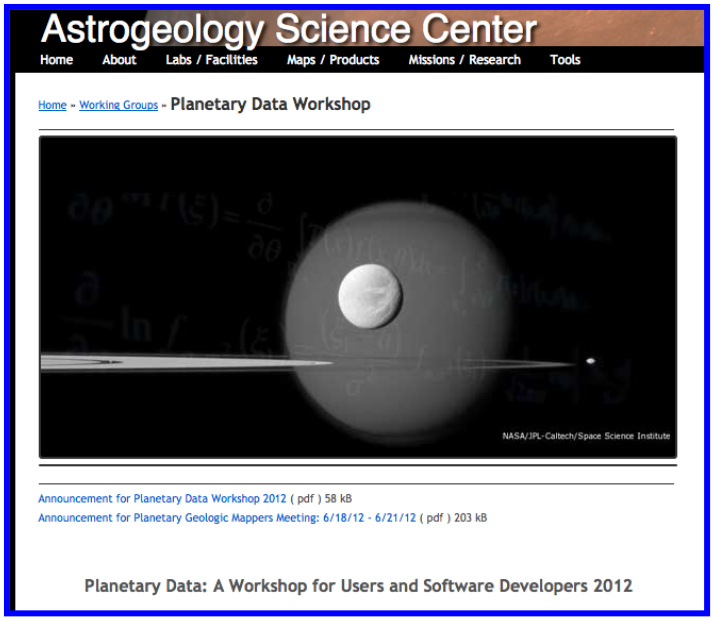
**Abstracts due April 30, 2012**

**Talks, posters, demos, hands-on training**

http://astrogeology.usgs.gov/groups/Planetary-Data-Workshop

# Outreach: Planetary Data Workshop

- **Current Missions**
  - LRO Diviner, LOLA
  - LROC NAC, WAC
  - MRO CRISM, HiRISE
  - MO THEMIS
  - MESSENGER
  - DAWN
  - Cassini (team workshop?)
- **Data Search Tools**
  - PDS
    - Atlas, ODE, AN, UPC/PILOT, etc.
  - JMARS, LMMP Portal
  - Google Moon, Mars, etc.
- **Data Analysis & Visualization Tools**
  - Opticks,  ENVI
  - ARCGIS, ISIS3
- **Other Activities**
  - PDS4 overview and tools
  - Future of data storage, data processing, etc.




http://astrogeology.usgs.gov/groups/Planetary-Data-Workshop

| Workshop for Data Users | Workshop for Software Developers |
|---|---|
| **Goals:**<br>• Share information on digital planetary data, including availability, access and analysis methods.<br>• Present how-to guides for locating, acquiring, processing and working with digital planetary data. | **Goals:**<br>• Bring researchers and technology experts together to discuss and exchange ideas to identify difficult planetary research issues that can be addressed by software development.<br>• Present planetary data processing and software development methods and techniques. |
| **Overview:**<br>This workshop will provide a forum for discussion of available planetary data, including a summary of **how these data are located, downloaded, processed, and used** for cartography and scientific data analysis. Although a detailed agenda is not yet available, topics to be addressed may include: basic data search and retrieval tools (e.g., the Planetary Image Atlas, the Orbital Data Explorers, the Analysts Notebook, PILOT, etc.) for data from current planetary missions, summary of data processing and visualization tools (e.g., ISIS, JMARS/JMOON, Google Mars/Moon, ArcMap, etc.), and an introduction to PDS4 for users and data providers. | **Overview:**<br>To facilitate planetary research, differing techniques are used across the community to solve issues related to data access, calibration, processing, fusion, and the creation of derived scientific products. These individual products help scientists to portray morphologic, topographic, and spectral compositions but prove to be more valuable by bringing the observations into a common spatial and visualization system. The topics for this workshop will heavily depend on community participation but will range from in-situ and orbital data integration, data processing, **software development and methods**, data interoperability, visualization techniques, high-speed and volume cluster processing, photogrammetry procedures and more. |

| Data User Track | | Common Day | Software Developer Track | |
|---|---|---|---|---|
| **Monday 25th** | **Tuesday 26th** | **Wednesday 27th** | **Thursday 28th** | **Friday 29th** |
| presentations for data users | presentations for data users | cooperative presentations linking developers and users | developer presentations | unconference – developer topics based on previous days |

Taking input on topics from online user polls and abstract submissions

PDS Nodes are most welcome!

Please let me or Ed Guinness know if you have questions.

Presentations, tutorials, cookbooks, etc. will be posted online via meeting website and PDS

http://astrogeology.usgs.gov/groups/Planetary-Data-Workshop

# Mission Interface: Current Work

- **Current Mission Archiving**
  - Cassini
  - Chandrayaan-1 - -- final mission release at beginning of FY12
  - LRO
  - MRO
  - MER
  - MESSENGER
  - Odyssey
- **Developing Missions**
  - MSL
  - JUNO
- **Other Activities**
  - Discovery “InSight” Data Management Plan
  - Planetary Image Atlas integrated into Mission Ops for Cassini, MER, MSL

# FY12 Data Releases & Volumes

| Project/ Instrument | Q1 Release | Q2 Release | Q3 Release (est) | Q4 Release (est) | FY12 Volume (est) | Overall Volume (end FY11) | Overall Volume (end FY est) |
|---|---|---|---|---|---|---|---|
| CAS/ISS | 12.5 GB (Oct 1) | 4.0 GB (Jan 1) | 10 GB (Apr 1) | 10 GB (Jul 1) | 0.04 TB | 0.42 TB | 0.46 TB |
| CAS/RADAR | 1.0 GB (Oct 1) | 1.2 GB (Jan 1) | 1.0 GB (Apr 1) | 7.1 GB (Jul 1) | 0.02 TB | 0.08 TB | 0.1 TB |
| CAS/VIMS | 6.3 GB (Oct 1) | 6.0 GB (Jan 1) | 4.0 GB (Apr 1) | 4.0 GB (Jul 1) | 0.02 TB | 0.13 TB | 0.15 TB |
| MO/THEMIS | 10.6 GB (Oct 1) | 90.0 GB (Jan 1) | 0.5 TB (Apr 1) | 0.5 TB (Jul 1) | 1.1 TB | 10.4 TB | 11.5 TB |
| MER/Cameras | 105 GB (Nov 23) | 116 GB (Feb 23) | 100 GB (May 24) | 100 GB (Aug 24) | 0.4 TB | 6.19 TB | 6.59 TB |
| MRO/HiRISE | 2.2 TB (Dec 1) | 2.0 TB (Mar 1) | 2.0 TB (Jun 1) | 2.0 TB (Sep 1) | 8.2 TB | 61.6 TB | 69.8 TB |
| MRO/CTX | 150 GB (Dec 1) | 200 GB (Mar 1) | 200 GB (Jun 1) | 200 GB (Sep 1) | 0.75 TB | 4.94 TB | 5.69 TB |
| MRO/MARCI | 50 GB (Dec 1) | 60 GB (Mar 1) | 60 GB (Jun 1) | 60 GB (Sep 1) | 0.23 TB | 1.42 TB | 1.65 TB |
| MES/MDIS | n/a | 50 GB (Mar 8) | n/a | 50 GB (Sep 15) | 0.1 TB | 0.15 TB | 0.25 TB |
| LRO/LROC | 26.1 TB (Dec 15) | 26.0 TB (Mar 15) | 26.0 TB (Jun 15) | 26.0 TB (Sep 15) | 104.1 TB | 194.8 TB | 298.9 TB |
| LRO/LAMP | 271 GB (Dec 15) | 350 GB (Mar 15) | 350 GB (Jun 15) | 350 GB (Sep 15) | 1.3 TB | 2.25 TB | 3.55 TB |
| CH/M3 | 3.07 TB (Sep 9 & Dec 8) | n/a | n/a | n/a | 3.07 TB | 5.57 | 6.84 TB |
| | | | | | ~119 TB | ~288TB | ~405 TB |

# Mission Interface: Data Nodes, Deep Archive

- **HiRISE Data Node (UofA, Tucson, AZ)**
  - Quarterly deliveries continuing (3/1/12 data release of ~2 TB)
  - Transfer of complete HiRISE EDR data set to IMG Flagstaff continues
  - SISs updated for new color orthophotos to be added to DTM dataset
  - HiRISE Disaster Recovery Plan finalized
- **THEMIS Data Node (ASU, Tempe, AZ)**
  - Quarterly deliveries continuing (1/1/12 data release of ~90GB)
- **LROC Data Node (ASU, Tempe, AZ)**
  - Quarterly deliveries continuing (3/15/12 data release of ~26 TB)
  - LROC SOC plans to reprocess all previously released data (releases 1-8)
  - Electronic transfers to IMG-JPL initiated; EDRs will be stored at Data Node, IMG-JPL & IMG-Flagstaff; CDRs at IMG-JPL & Data Node
  - **~300 TB** of data storage hardware in-hand at each site
- **NSSDC 'deep archive' transfer**
  - Viking Orbiter and Magellan volumes staged and in progress

# Data Access: Imaging Node Web Site

**Status:**

- Updates to look & feel, usability
  - Updating Mission Pages with consistent content & look, links to documentation
- New content
  - Wrote or co-wrote tutorials (*next slide*) for use and processing of more challenging data sets
  - ISIS3: Cassini ISS, VIMS & RADAR in progress
  - Project-authored Cassini Radar Users Guide posted
  - Project-authored Cassini ISS Users Guide (in review)
- Proposal Support
  - Online summary of all Data Holdings, data set name, id, and archive status (accumulating, certified, etc.)

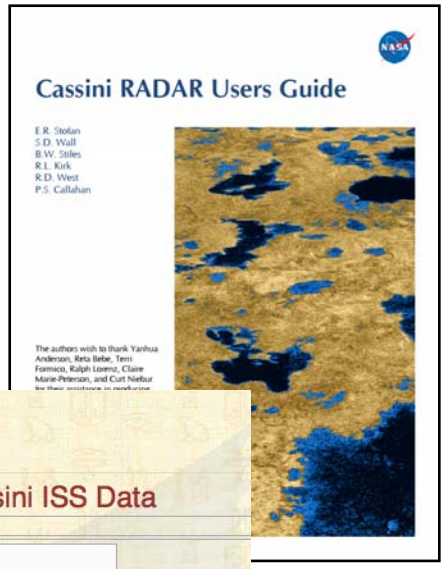
**Plans:**

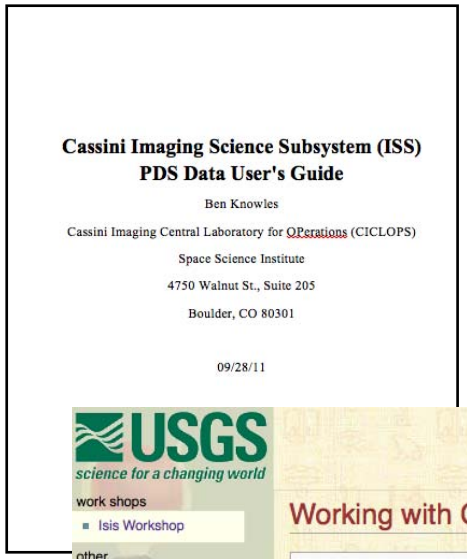
- Continue to create and/or distribute tutorials for accessing PDS data for each mission supported
- Continue to add missions and supporting information, as well as pointers to data and services, as new data releases are received

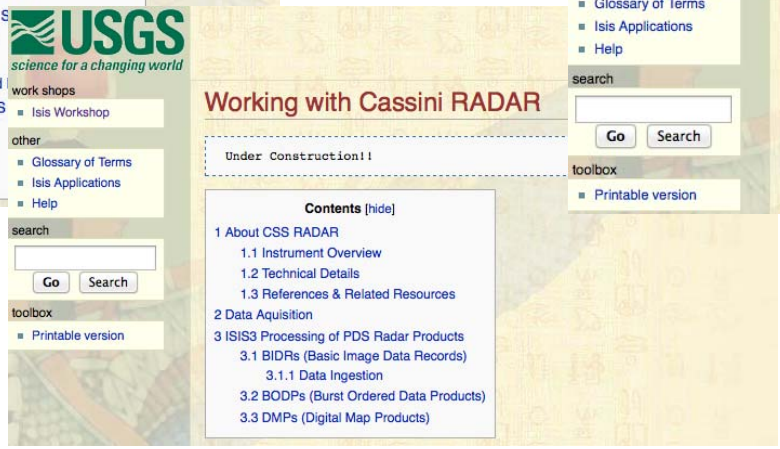
http://pds-imaging.jpl.nasa.gov/

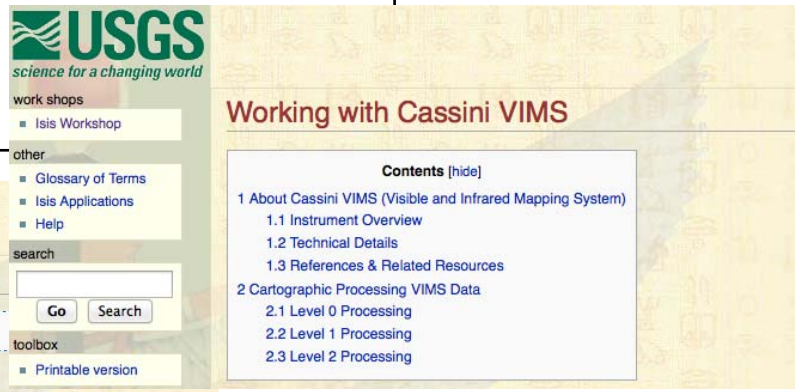
# Data Access: Imaging Node Web Site

- **Tutorials & User Guides**





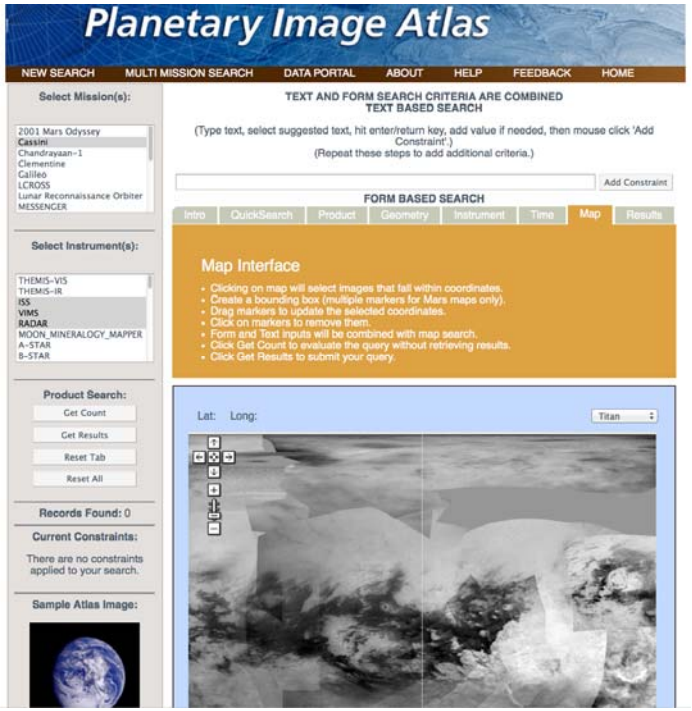




http://pds-imaging.jpl.nasa.gov/software/

# Data Access: Planetary Image Atlas

**Status:**

- Missions/datasets added - Database, metadata, thumbnail/browse, user interface
  - Chandrayaan-1/M3 Level 0, 1B & Level 2
  - Voyager
  - MER Pancam Science
  - MEX (re-ingested updated versions & backlog)
- Enhancements to Cassini usability in collaboration with Cassini scientist, Soderblom (map, coordinates, search keywords, documentation, etc.)
- **Metrics: 13.7 TB/month downloaded; 8.8K unique visits/month**




**Plans:**

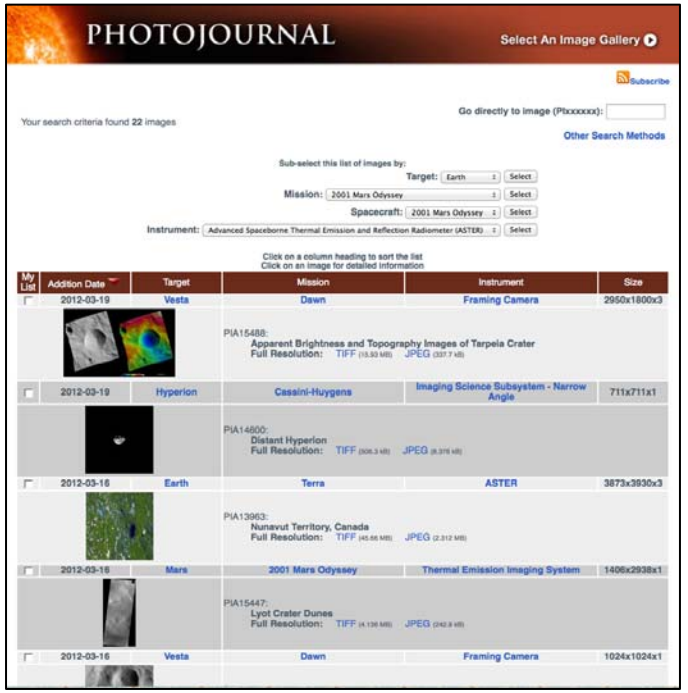
- Complete additional Cassini enhancements
- Update searches to ensure consistency in coordinate systems
- Google Maps-based searches for more targets (orbital and landed)
- Streamlined process for thumbnail & browse creation
- Complete integration with USGS Gazetteer to facilitate search by feature name
- Integrate with PDS2010 services as available; provide XML version of PDS labels

http://pds-imaging.jpl.nasa.gov/search

# Data Access: Photojournal

**Status:**

- Updated *Space Images* app
  - Free iPhone & iPad app hosting thousands of Images – Version 2.01 released
  - Photojournal provides backend functionality
  - Jointly funded by JPL Media Relations
- **Metrics: >6.6 TB/month downloaded (peak of 8.4 TB in November);**
  **~100 images/month added**




**Plans:**

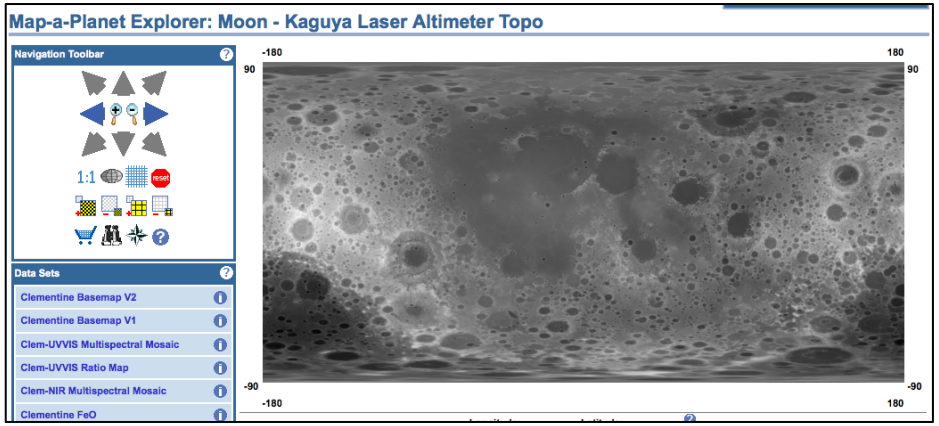
- Upgrades underway
  - Redesign of database schema and disk storage Directory approach
  - Enable secure upload and preview of images prior to quality control and publishing
  - Add batch download option from the Favorites page

http://photojournal.jpl.nasa.gov/index.html

# Data Access: Map-A-Planet (MAP)

**Status**:

- Responded to multiple user inquiries
- Performed general software and interface bug fixes, system maintenance, migration to updated storage.
- **Metrics: 155 GB/month downloaded; 5317 unique visits/month**




**Plans:**

- Complete Cassini-Titan map ingestion
- Continue with user inquiry response, user assistance and general system maintenance
- Support Carto-funded development of MAP2 architecture
  - Simplifies maintenance, speeds up data ingestion and delivery

http://www.mapaplanet.org/

# Data Access: UPC & PILOT

**Status:**

- Data updated and/or added

| | |
|---|---|
| Cassini VIMS | Odyssey THEMIS |
| Messenger MDIS | Clementine |
| MGS MOC | Cassini ISS |
| Galileo SSI | Viking Orbiter |
| Voyager ISS | |

- Added reporting function for EDR files that error out during processing
- Users will see fraction of data found vs. available in PDS
- Added support & reporting for multi-band instruments
- Links to db from Atlas, GEO updated
- **Metrics: 1.03 Gb/month downloaded; 3381 unique visits/month**

**Plans:**

- Update Pilot interface & shapefile downloads to support error and multi-band reporting functions
- Support ingestion of (level 2) radar data
- Reduce dependence on ISIS3 camera models
- Add
  - LROC NAC/WAC, Dawn FC, Voyager 1 UVS, Lunar Orbiter III, IV, V

http://pilot.wr.usgs.gov/

# IMG & PDS4

- **System Architecture**
  - ***Jordan Padams & Alice Stanboli are IMG WG Members***
  - Deployed Build 2B Registry software within IMG-JPL to provide opportunity for testing, training, tool development and feedback to EN
  - Modified IMG-JPL web logs in preparation for Report Service ingestion and implementation

- **Data Design**
  - ***Amy Culver, Chris Isbell & Elizabeth Rye are IMG WG Members***
  - Support PDS4 build tests
  - Continue formulation of IMG classes & local dictionaries
    - PDS3-to-PDS4 keyword/object mapping and data set migration testing
    - Classes include camera, command, geometry, compression, telemetry, cartographic/map projection
    - Test data sets span range of instrument types: Clementine, Cassini ISS & VIMS, Mars Pathfinder IMP/RVR, Mariner 10, Voyager
    - Provides direct PDS4 integration and training opportunity for IMG personnel
  - Collaborate with other nodes on similar design decisions and issues
  - Report progress, lessons learned and issues thru DDWG and at Tech Sessions

# Restorations

| Data Set | IMG POC | Status | Volume Expected |
|---|---|---|---|
| LO Digitized Film Archive | Chris Isbell | Complete final updates from FY11 review & processing team. Add C. Byrne LO scanned data (revised destriping) to supplement the existing archive. | ~750 GB |
| LO Image Recovery Project | Rafael Alanis | No activity on the project side due to gap in funding of LOIRP project (D. Wingo) | ~10 TB |
| Apollo Digitized Film Archive, Metric, Pan | Patty Garcia | Integrating Peer Review comments into Apollo Metric archive data products. Scanning of Pan data still ongoing. | ~ 85 TB |
| Apollo Rock Sample Image Archive | Patty Garcia | In final stages of Peer Review for Apollo 17 archive. Still several months out from completion of all scanning at JSC. | ~35 TB |
| Kaguya/SELENE (JAXA) | Lisa Gaddis | Tutorial online for Terrain Camera; Proposal to LASER for MI processing s/w in ISIS3, to Carto for global TC mosaics (morning & evening) for MAP | ~100 TB |
| Mariner 9 (Mike Martin) | Amy Culver | Continue collecting, processing, validating data from various sources (SDDPT, MDR). PDS4 Test Case. | tbd |

# FY12 Other Data Acquisition & Synching

| Project/ Instrument | Notes | FY12 Volume |
|---|---|---|
| LRO/LROC | Syncing copy of data from UofA to IMG-JPL | ~300 TB |
| MER/Cameras | Working with GEO to correct and/or document problems in labels and metadata | n/a |
| MER/PANCAM Science | IMG serving a copy of this GEO dataset; received first set, more to come | 170 GB |
| MER/Cameras | Syncing copy of entire holdings to UCL (England); after caught up will sync each release | 6.5 TB |
| MEX HRSC | IMG holdings brought up to date (sync with GEO) | 8.2 TB |
| MRO/RSDS | RAID problems on project side delayed deliveries, resulting in very large backlog | 1.2 TB |
| | | ~ 320 TB |