

Small Bodies Node

Ludmilla Kolokolova

**Michael A'Hearn, Carol Neese, Don Davis,
Anne Raugh, Tilden Barnes, Jesse Stone**

**MC Face-to-Face
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Mission/Active Archive Highlights For FY2014

- **Dawn**

- Status: arrives at Ceres in March or April 2015
- Archive Development:
 - Mars/Cruise:
Archived: GRaND raw
In lien resolution: GRaND calibrated, FC raw and calibrated, and VIR raw
 - Vesta:
Archived: GRaND raw approach and survey, FC raw and calibrated for all Vesta phases, and SPICE.
Certified / in liens resolution: GRaND raw HAMO, LAMO, and Departure, VIR raw and calibrated for all Vesta phases, and GRaND higher level maps.
Not yet submitted for review (*and past due*):
 - all Radio Science data,
 - GRAND Calibrated data at Vesta (higher level maps in lien resolution),
 - FC and VIR higher level products, including shape model.
- **Upcoming releases:** Data listed above as Archived or Certified are already released. Data not yet submitted for peer review are TBD.
- **Planned/remaining peer reviews:** Additional reviews will happen once the remaining data are submitted for peer review.
- **Issues, Concerns:**
 - missing 3 micron data for VIR calibrated data;
 - no believable schedule for delivery of higher level products from FC and VIR;
 - uncertain schedule for delivery of data at Ceres

Mission/Active Archive Highlights For FY2014

- **Deep Impact/EPOXI/DI3**

- **Status:** Mission operations ended in Sept.19 2013

- **Archive development:**

- Last review was in March 2014; included the data on comets ISON and Garradd and recalibrated data from previous stages of the mission; all together 16 datasets (331.5 GB). All data certified.

- Current archive contains 62 (257GB) DI and 57 (1.11TB) EPOXI datasets

- **Upcoming releases:** the data reviewed in March have been released

- **Planned/remaining peer reviews:** none

- **Cassini (CDA and HRD dust instruments)**

- **Status:** mission may end at the end of 2014

- **Archive Development:** quarterly deliveries of data from the Cosmic Dust Analyzer (CDA) and High Rate Detector (HRD) instruments. In addition, CDA is close to delivering new calibrated data for peer review.

- **Upcoming releases:** next regular CDA and HRD releases will be in July and October.

- **Planned/remaining peer reviews:** CDA calibrated review planned for May.

Mission/Active Archive Highlights For FY2014

- **New Horizons**

- Status:

- Pluto-Cruise stage; hibernation since 2007, however in 2012 took some data (calibration, plasma, dust, KBOs, Centaurs); will reach Pluto in July 2014

- In January 2014 we reviewed Pluto-Cruise data of 2012: Alice, SWAP, PEPSSI (certified); LEISA, LORRI, MVIC (uncertified); and **SDC** data from the beginning of the mission (new calibration) - rejected

- Archive Development:

- 81 (133.85 GB) datasets; among them 10(8.11GB) in lien resolution from the recent review

- Upcoming releases:

- Pluto-Cruise data reviewed in January are expected in May 2014

- Planned/remaining peer reviews:

- REX and SDC data (June 2014)
second part of Pluto-Cruise (2015),
Pluto flyby(2016), KBO flyby...

Mission/Active Archive Highlights For FY2014

Rosetta

- **Status:**
 - Successfully woke up from hibernation in January 2014. Instruments are being turned on this month. OSIRIS and ALICE are operational and OSIRIS has already measured a rotational light curve of the comet. Everything was colder than expected when turned on. ROSINA turned itself off because the temperature was 0.4k below their temperature threshold.
 - Currently in comet approach stage; will reach comet 63P/C-G in August 2014; landing in November 2014. Planned end of mission in December 2015.
- **Archive Development:**
 - Currently 403 datasets 184 GB, among them 150 (33 GB) uncertified.
 - Will be sample data deliveries earlier summer
 - There won't be any data deliveries until after the lander is delivered (early December 2014)
- **Upcoming releases:**
 - Pre-landing comet 67P/C-G data – not earlier than winter 2015.
 - Still have data for asteroids Steins and Lutetia in lien resolution; delivery uncertain;
 - many before-Steins and after –Lutetia data released “in peer review,” i.e. never reviewed.

Mission/Active Archive Highlights For FY2014

Rosetta

- **Planned/remaining peer reviews:**

no peer reviews by PSA, only DVal validation and archiving if it passes it. In early summer sample data will be validated using DVal to check preparedness of the instrument pipelines.

- **Issues, Concerns:**

- The majority of instrument teams have not developed a pipeline, no configuration control. Potential problem with future data not being of the quality considered as archival at PDS
- Understaffed PSA
- Missing pre-encounter data may be never archived (never of archival quality).
- In the PDS Central Data Set Search, there is a problem with having Rosetta data pointing to PSA, not SBN. This is especially important as PSA archived uncertified data whereas we release them as “in peer review”, not “archived”
 - Importance of dataset status indication in the registry!
 - The central registry should ALWAYS point first at data in PDS with other sources secondary.

Mission/Active Archive Highlights For FY2014

- **LADEE (LDEX instrument)**

- **Status:** extended mission; will be disposed by impacting the lunar surface around 21 April 2014.
- **Archive Development:** PDS4 data bundle produced via OLAF (SBN-OLAF schema) ; currently in internal review,. This system worked well for the pre-launch.
- **Planned/remaining peer reviews:**
Review of first 100 days of science data (nominal mission) is scheduled for May/June.
Review of extended mission planned for November.
- **Upcoming releases:**
Release of first 100 days of science data planned for August (available for Lunar DAP).
Remainder will be reviewed in November, released 6 months after the first release.

- **OSIRIS-REx**

- **Status:** launch is planned for September 2016 (7 years long mission)
- **Archive Development:** Data bundle and collection organization have been planned. Currently Osiris-Rex is designing the data products and labels, with help of SBN.
- **Upcoming releases:** not yet scheduled
- **Planned/remaining peer reviews:** Four data product design reviews scheduled for August. The peer reviews have been planned and roughly scheduled, including a total of 19 reviews over the years 2014-2022.
- **Issues, Concerns:** the classes that are not yet available through the discipline dictionary will be provided SBN dictionary

Mission/Active Archive Highlights For FY2014

- **Stardust NExT**

- **Status:** Mission ended in March 2011
- **Archive Development:** archived 8 datasets (56 GB)
- **Upcoming releases:** recalibrated data, pre-review release May 2014 (data for the June review)
- **Planned/remaining peer reviews:** June 2014, recalibrated NAVCAM data

- **BRRISON**

- **Status:** no data on comet IDSON taken; mission renamed; plans to observe comet Siding Spring
- **Archive Development:** ground-based test data for IR camera (BIRC) some housekeeping and temperature data; ~15GB are delivered to SBN for safing (in PDS3).
- **Upcoming releases:** April –May 2014 (safed data)
- **Planned/remaining peer reviews:** depends on success of the mission

- **FORTIS**

Rocket mission to comet ISON

Derived Products and Restoration Highlights For FY2014

- Archive development:

SBN regularly archives derived products from past missions submitted under DAP programs and recalibrated versions of existing datasets

- Upcoming releases:

- Galileo SSI radiometrically corrected image cubes of Gaspra
- Galileo NIMS radiance point spectra of Gaspra
- IHW near-nucleus images of comet Halley; it was required to be updated by PDS users who found wrong or undefined orientation of the images that prevented them from analysis of the data – orientation of images is still unresolved issue in PDS4!

- Upcoming peer reviews in 2014:

Galileo and IHW datasets will be reviewed in June

Support archives Highlights For FY2014

- **Ground-Based observations**

- Archive development: 280 datasets, 837 GB
- Upcoming releases: Tempel 1 KPNO and MOSAIC images in April
- Planned/remaining peer reviews:

We collect, review, and archive 15-20 ground-based data sets per year with Asteroid annual review (May/June) and comet data reviewed in conjunction with mission reviews

- Plan for 2014

Asteroids: asteroid spectra, occultations, lightcurves and polarimetry; TNO colors and albedos

Comets: UH Tempel 1 observations and compilation of the data for comet 63P/Churyumov-Gerasimenko and ISON

- **Laboratory data (spectra, optical constants)**

- Archive development: 4 datasets, 80 MB
- Upcoming releases: none (but lab spectra of CH₄ ices just has been released)
- Planned/remaining peer reviews: meteorite data during Asteroid review in June

PDS4 Migration Highlights For FY2014

- Status:
 - No datasets migrated or planned for FY2014
- Issues and Concerns:
 - Highest priority datasets require geometry, which is not ready
 - No return on the effort until we have a working registry, which is waiting on programmer time to install and populate.
- Staff time (WY) supporting DDWG activities including tiger teams:
 - Anne Raugh: ~50% (12 days per month)
 - Mike Kelley: 2-3 days per month
 - Tony Farnham: 8-20 hours per month
- Staff time (WY) supporting CCB:
 - Carol Neese: 10 hours per month.

Data Holdings and Deliveries Highlights For FY2014

UMD

- Current volume/Data Sets:
673 datasets, 3.15 TB (all PDS3)
- Expected volume (through
October 1 2014):
~800 datasets, 5 TB volume
- NSSDC deliveries:
completed: 451 data sets, 2.49 TB;
expected: ~30 data sets, ~0.5 TB
- Issues, Concerns:
We are planning to put off-line
superseded datasets to save disk space.
Policy and procedures are in
development. This is one more issue
that required status information in the
registry!

PSI

- Current volume/Data sets:
425 datasets, 3.2 Tb. (all PDS3)
- Expected volume through Oct. 1
Expect to add ~100 Tb
(dominated by NEAT survey)
- NSSDC deliveries:
up-to-date except for Dawn Vesta FC
and first installment of NEAT
archived in Jan/Feb and to be delivered
to NSSDC this spring.
- Issues, Concerns :
MPC continues to fail to meet
delivery schedule

Other activities

Highlights for 2014

- NASA Challenge:

SBN is polishing the public website for promotion to developers, and making sure we stay in sync with the database development being done to accommodate the Rings challenges. Roll-out should be the week after MC.

Next step is incorporating the asteroid holdings at PSI into the database (timetable is under discussion).

- Student-Investigators:

Mark Moretto started in March; topic: "Comparison of natural outburst materials of comet Tempel 1 and Deep Impact ejecta using DI infrared spectra"

Security

- **Disaster Recovery Plan**

- Data mirroring to UMD/PSI in its final stage; the servers will be sent to UMD from PSI within two weeks
- PSI is improving local backups, switching away from using external USB hard drives for backups, to dedicated backup appliances. This allows the backups easier to perform and automate, and increases the amount of available backup storage.
- Considering cost effectiveness of redundant drives vs. RAID arrays vs. NAS units, but as yet no decision to change strategy has been made (at UMD this is affected by availability of new server space).

- **IT Security Planning**

- The UMD Astronomy department is undertaking security upgrades. We were planning to move to department-maintained servers and will get the immediate benefit of that.
- UMD replaces all XP computers to assure that our Windows computers have up-to-date security.
- PSI monitoring tools have been improved to a combination of in-house and open-source tools. These include ganglia to watch for unexplained load spikes, and logwatch and currently evaluating AlienVault OSSIM. The tools are used in conjunction with the IT department.
- PSI accelerated the timetable for applying updates to the servers, to reduce the window for known vulnerabilities to be exploited.
- PSI data archive is now served on a different server from applications. This makes the archive no longer be threatened by any vulnerabilities in our web applications and allows security updates or respond to attacks without having to take down the archive.

- **Issues and Concerns**

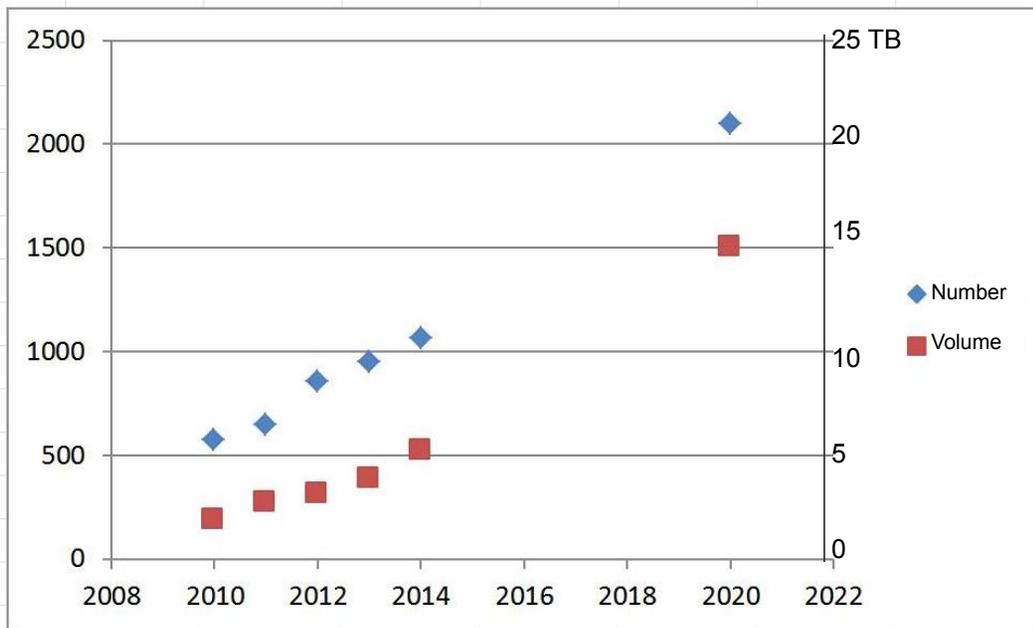
- SBN UMD is being moved from its current location, partly into a new building. The server space we thought we had been promised has been withdrawn. We are negotiating with the University for secure server space. It may require redesigning our disaster recovery plan.

NEXT 5 YEARS 2015-2019

Prediction of archive growth

number of datasets > 2000

volume of the datasets ~15 TB



+ 1000 datasets and 10 TB if we keep PDS3 and PDS4 versions of existing datasets

MISSIONS

Dawn 2 TB

O-Rex 0.7 TB

New Horizons 0.5 TB

Discovery-2015 mission?

Balloon missions?

Rosetta 50 TB

(mission and support)

Surveys 300-500 TB

(NEAT, LONEOS, SPACEWATCH)

NEXT 5 YEARS 2015-2019

New challenges for PDS4

- **The PDS4 tool releases are not keeping in sync with the information model releases.**
- **The PDS4 tool for installation procedure** . Not industry-standard, still requires a user to add an element to his execution path for every installed tool, for example.
- **Tool to validate content of the data object.**
- **Simple visualization tool**, like NASAView for PDS4 data.
- **Open source editor** that is almost as good as the OXYgen commercial editor is. Eclipse is pretty close, but major issues with Schematron and XML Catalog implementations in Eclipse present roadblocks for PDS data preparers.
- **Training materials for new data preparers** (to run workshops and for self-teaching).
- It's not clear whether the currently **available tools can work with labels based on the latest schemas released.**
- **Website descriptions for the PDS4 tools** available are not good (e.g. had to download and unzip the transform package, before could find a list of what transformations it could do).
- The whole **local dictionary generation process** needs to be beefed up substantially to be reasonably congenial to data preparers and to support review needs for local dictionaries. LDDTool does not show any improvement.
- How **archive status** is going to be **tracked** in the registry? This is critical since we have to be able to tell our users which data are DAP-eligible! How we can retrieve it to use it in web pages? How we are going to be updating and maintaining it? If it's not going to be in the registry, we need to know how it's going to be tracked ASAP.

NEXT 5 YEARS 2015-2019

New tools that you would like to see

- Already in development or planned at SBN:
 - READPDS4 for IDL (beta version released)
 - OLAF port to PDS4
 - Data Ferret port to PDS4 and registry
 - Small bodies mapping tool (APL)
 - Small bodies data browser
- Developed by the nodes (not necessarily SBN):
 - Quick-look, command-line or GUI display tool(s) for PDS4 observational data files (need these for reviewers and could also be incorporated into web sites).
 - Display code for plugging into node websites to turn label URIs into registry links.
 - Display code to reformat PDS4 XML labels on the fly for web browser (so we could have a "View As" option for those not at home reading XML)
- Developed by Someone else (NASA Tournament Laboratory?)
 - Plug-ins for open source editors (like Eclipse) to make them more useful for our data preparers on a budget.
 - ImageMagick modules for PDS4 image data types.
 - Plug-ins for reading PDS4 image data types into various elements of the Adobe Creative Suite (PhotoShop, for example)
 - ISIS3 to PDS4 conversion, and the inverse
 - Apps for subscribing to data release and status update reports for PDS4 data sets

Thank you