

Archives 201

Exploring science datasets with archiving tools

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Organisation of Lectures



- 1. Space Science Archives Why and How?** Today 15h-16h
→ You will become supportive of archives
- 2. Practical session – Getting the data you need!** Today 16h30-17h30
→ You will become the source of “complains” to the archives
- 3. Tools useful for exploring science datasets** Monday 15h-16h
→ You will become the source of “requirements” to the archives
- 4. Practical session – Understanding you download** Monday 16h30-17h30
→ You will become the first generation of “archive” educated scientists that will provide “complete and well-documented” datasets to be archived in the future

What are the needs



Now, you have an idea on how works an archive.

You have explored 4 different approaches for retrieving datasets.

What did we learned from that?

What is it that you need?

What are you requirements? How can we improve our services to you?

What are the key players here....



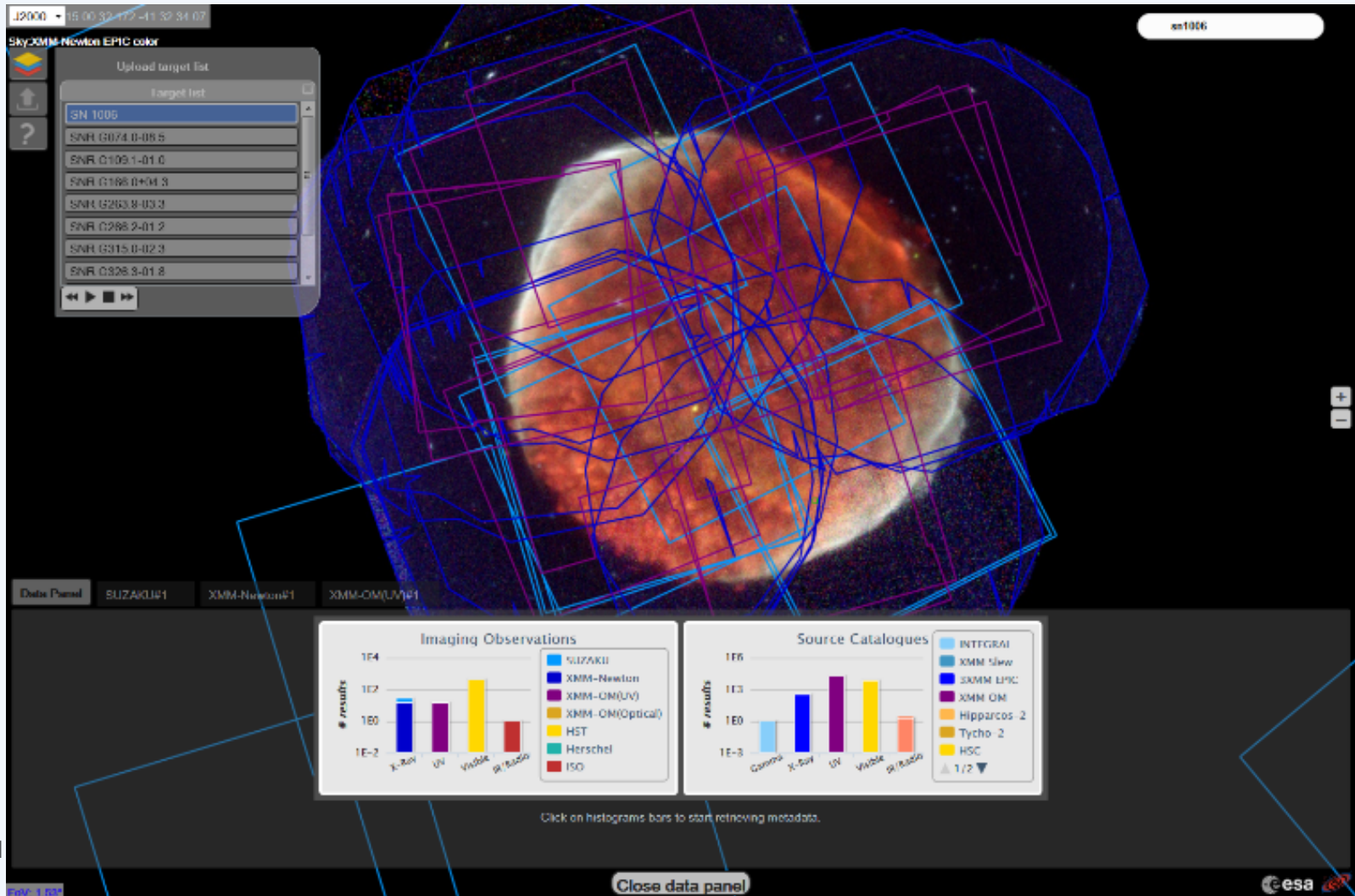
- 1. ESA's PSA:** One interface for all Planetary Missions
- 2. NASA:** Different interfaces, some more useful than others
- 3. Mission specific tools:** You have to know about those interface, they are in some cases linked to the agency archives and often more useful (i.e. mission specific) than the general agency interfaces.
- 4. SPICE tools:** SPICE provide tremendous information for geometry. You don't need to know SPICE for this 😊, just do some clicks and send an email to Marc

I will show you examples on those interfaces so that you get used to them and eventually combined interfaces to get the best information you need

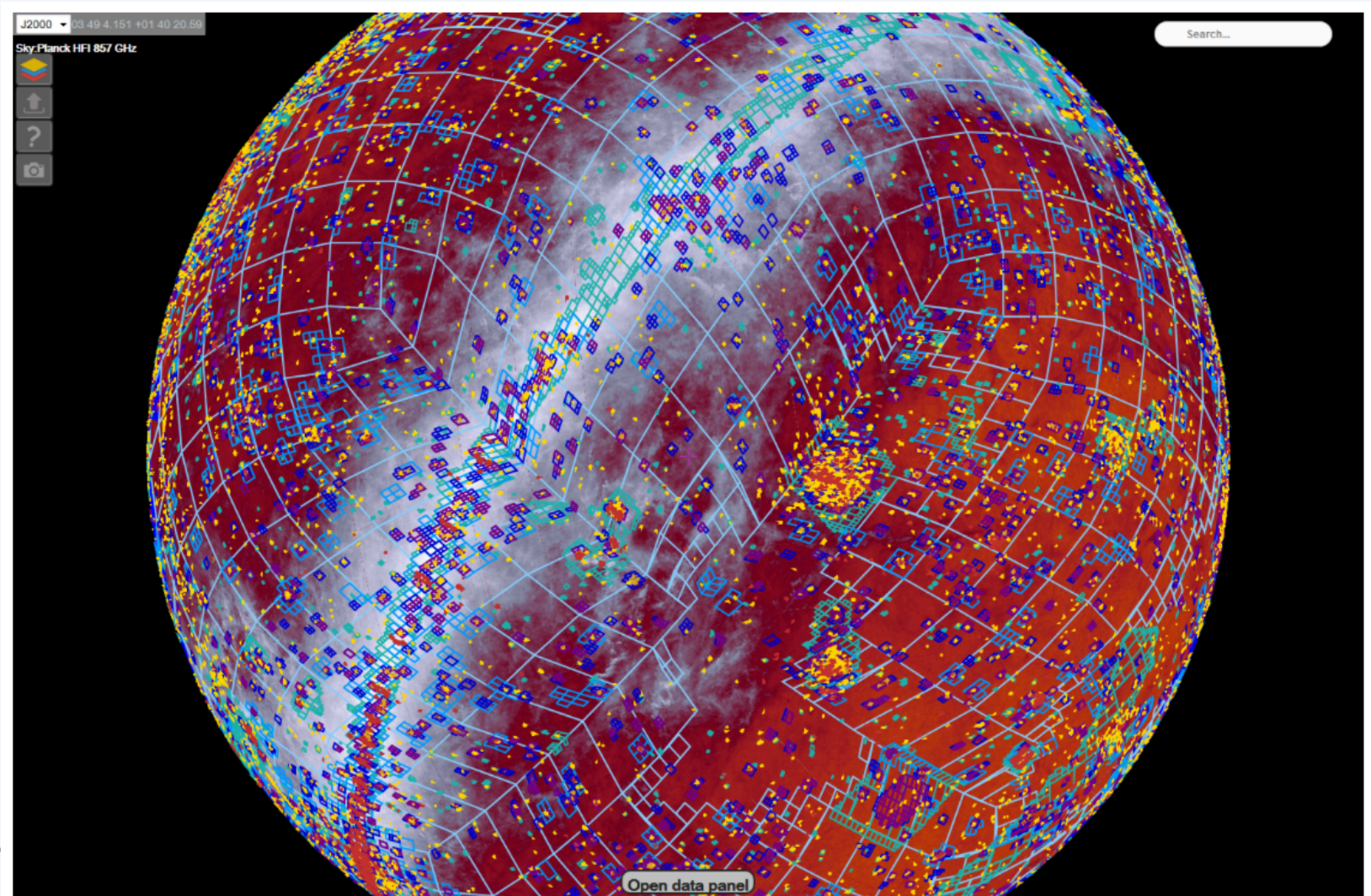
Archives 201

ESA SKY

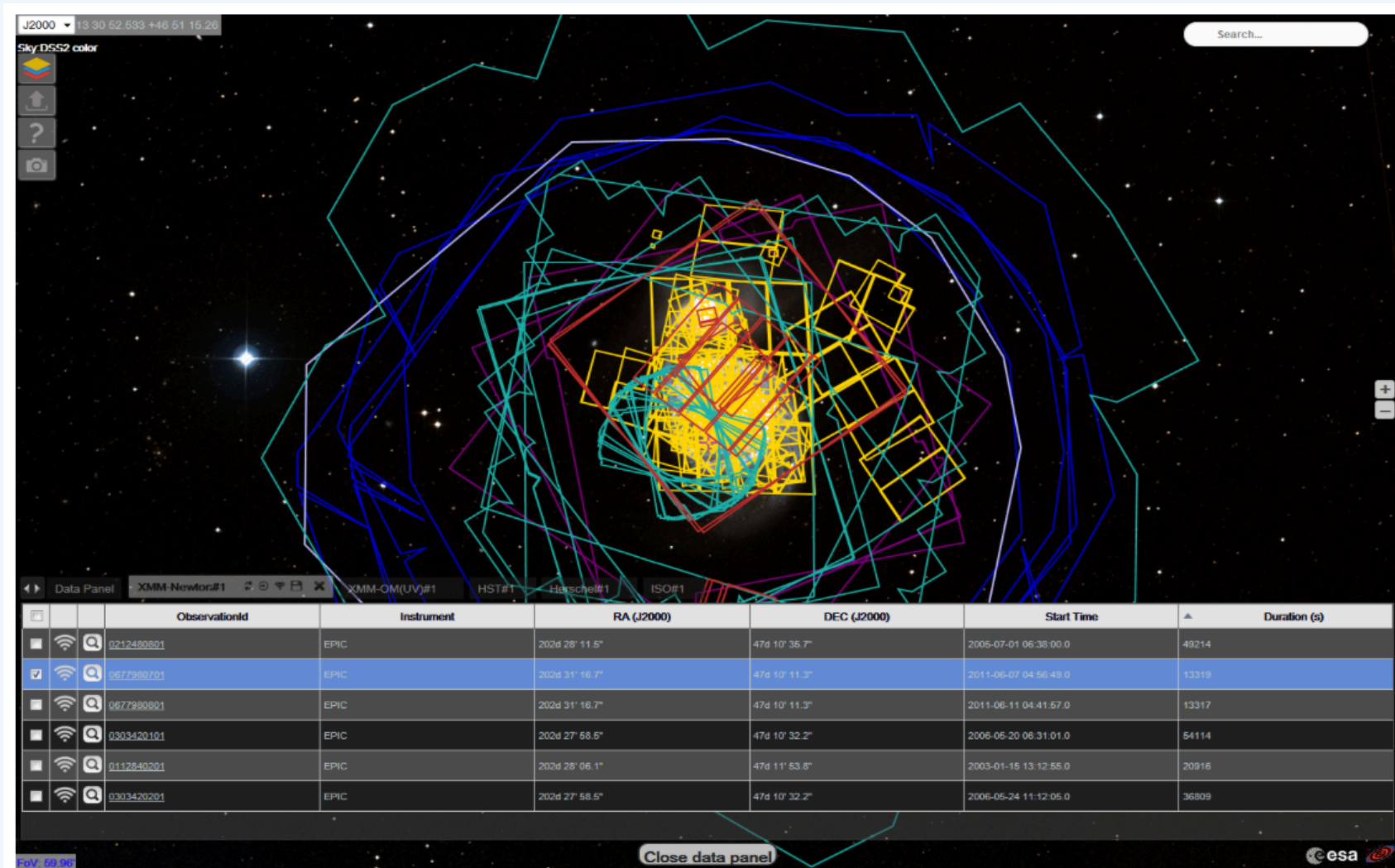
sky.esa.int



sky.esa.int



sky.esa.int



J2000 13 30 52.633 +46 51 15.26
 Sky DSS2 color
 Search...

XMM-Newton#1 XMM-OM(UV)#1 HST#1 Herschel#1 ISO#1

ObservationId	Instrument	RA (J2000)	DEC (J2000)	Start Time	Duration (s)
0212480801	EPIC	202d 28' 11.5"	47d 10' 35.7"	2005-07-01 06:38:00.0	49214
0677980701	EPIC	202d 31' 16.7"	47d 10' 11.3"	2011-06-07 04:56:49.0	13319
0677980801	EPIC	202d 31' 16.7"	47d 10' 11.3"	2011-06-11 04:41:57.0	13317
0303420101	EPIC	202d 27' 58.5"	47d 10' 32.2"	2006-05-20 06:31:01.0	54114
0112840201	EPIC	202d 28' 06.1"	47d 11' 53.8"	2003-01-15 13:12:55.0	20916
0303420201	EPIC	202d 27' 58.5"	47d 10' 32.2"	2006-05-24 11:12:05.0	36809

Close data panel

Archives 201

NASA Orbiter Data Explorer (ODE)

Nasa's Orbiter Data Explorer (ODE)



A tool mostly dedicated to **Remote Sensing instruments**

Search is done by

- **missions**
- **instruments**
- **versions of datasets (calibrated, raw, derived products)**
- **spatial location**

This is a tool very useful for exploring one of the above points, or just get to what you need in an efficient way

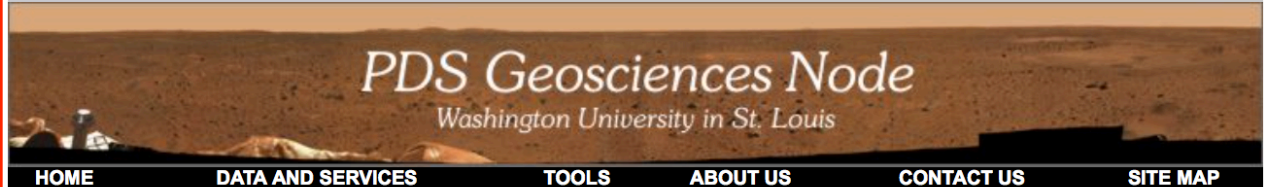
<http://ode.rsl.wustl.edu>

Nasa's Orbiter I



NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

+ NASA Homepage
+ NASA en Español
+ Contact NASA



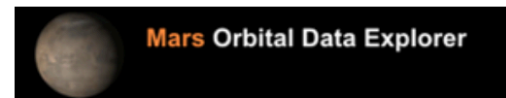
Welcome to the Orbital Data Explorer

The **PDS Geosciences Node Orbital Data Explorer (ODE)** website is a cross-mission and instrument query, search, display, and download tool for locating and retrieving PDS orbital science data archives of **Mars, Mercury, Venus, and Earth's moon.**

Orbital Data Explorer Targets:

Mars Orbital Data Explorer

The Mars Orbital Data Explorer (ODE) provides search, display, and download tools for selected PDS science data archives of the Mars Reconnaissance Orbiter (MRO), the Mars Global Surveyor, and the European Space Agency's Mars Express missions.

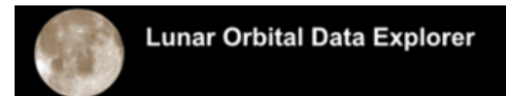


Supported Missions and Instruments:

Mars Reconnaissance Orbiter (MRO): CRISM, CTX, Gravity/Radio Science, HiRISE, MCS, SHARAD
ESA's Mars Express: HRSC, MARSIS, OMEGA, PFS
Mars Global Surveyor: MOC, MOLA

Lunar Orbital Data Explorer

The Lunar Orbital Data Explorer (ODE) provides search, display, and download tools for the PDS science data archives of the Lunar Reconnaissance Orbiter (LRO), the Clementine, the Lunar Prospector, and the Indian Space Research Organisation's Chandrayaan-1 missions.

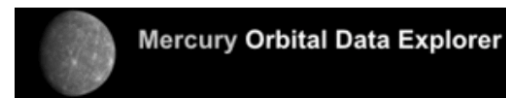


Supported Missions and Instruments:

Lunar Reconnaissance Orbiter (LRO): DLRE, LAMP, LEND, LOLA, LROC, MRFLRO
ISRO's Chandrayaan-1: M3
Clementine: HIRIS, LIDAR, LWIR, NIR, RSS, UVVIS
Lunar Prospector: ER, GRS, MAG, NS, RSS

Mercury Orbital Data Explorer

The Mercury Orbital Data Explorer (ODE) provides search, display, and download tools for the PDS science data archives of the MESSENGER (Mercury Surface, Space Environment, Geochemistry, and Ranging) mission.

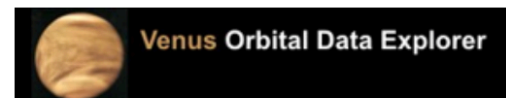


Supported Missions and Instruments:

MESSENGER: GRS, MASCS, MDIS-NAC, MDIS-WAC, MLA, NS, RSS, and XRS

Venus Orbital Data Explorer

The Venus Orbital Data Explorer (ODE) provides search, display, and download tools for the PDS science data archives of the Magellan mission and the MESSENGER mission's Venus data.



Supported Missions and Instruments:

Magellan: RDRS, RSS
MESSENGER (Venus Data): GRS, MASCS, MDIS-NAC, MDIS-WAC, MLA, NS, RSS, and XRS

Nasa's Orbiter Data Explorer (ODE)



Home Data Product Search Map Search Tools Data Set Browser Download Help & Resources

Lunar ODE Map Interface - Cylindrical Center 0

Zoom In Zoom Out Full Extent Prev Extent Next Extent Pan Select Products By Area Remove Area Selection Select Projection Map Help

Map Display Controls

Select Layers Set Filters (Optional) View Selection Results

- LRO - MRFLRO BSDDR [show details](#)
- LRO - MRFLRO BSEDR [show details](#)
- LRO - MRFLRO MAPCDR [show details](#)
- LRO - MRFLRO MOSCDR [show details](#)
- LRO - MRFLRO MOSDDR [show details](#)
- GRAIL - LGRS RDR [show details](#)
- CH1-ORB - M3 CALIMG [show details](#)
- CH1-ORB - M3 CALIV2 [show details](#)
- CH1-ORB - M3 CALIV3 [show details](#)
- CH1-ORB - M3 REFIMG [show details](#)
- CH1-ORB - MRFFR CDR [show details](#)
- CH1-ORB - MRFFR MOSCDR [show details](#)
- CH1-ORB - MRFFR MAPCDR [show details](#)
- LUNAR RADAR - RTLS/GBT RADL1 [show details](#)
- LUNAR RADAR - RTLS/GBT RADL2 [show details](#)
- LUNAR RADAR - RTLS/GBT SRADL2 [show details](#)
- CLEM - HIRES MDIM [show details](#)
- CLEM - HIRES EDR [show details](#)
- CLEM - LIDAR RDR [show details](#)
- CLEM - LWIR RDR [show details](#)
- CLEM - LWIR EDR [show details](#)
- CLEM - NIR EDR [show details](#)
- CLEM - RSS GRAV [show details](#)
- CLEM - RSS BSR5 [show details](#)
- CLEM - UVVIS MDIMG [show details](#)
- CLEM - UVVIS MDIM [show details](#)
- CLEM - UVVIS EDR [hide details](#)

UVVIS EDR - Experiment Data Record - (footprint layer)
[More about this Data Set](#)
Set Layer Transparency
invisible transparent opaque

- LP - RSS GRAV [show details](#)
- LO - 24Inch_FLC CDR [show details](#)
- LO - 80MM FLC CDR [show details](#)
The main map area displays a cylindrical projection of the Moon's surface. The surface is shown in shades of blue and grey, with numerous craters and features visible. A grid of latitude and longitude lines is overlaid on the map. A vertical scale bar is located on the left side of the map. The map is titled 'Lunar ODE Map Interface - Cylindrical Center 0'.

Nasa's Orbiter Data Explorer (ODE)



Home Data Product Search Map Search Tools Data Set Browser Download Help & Resources

Lunar ODE Map Interface - Cylindrical Center 0

Zoom In Zoom Out Full Extent Prev Extent Next Extent Pan Select Products By Area Remove Area Selection Select Projection Map Help

Map Display Controls

Select Layers Set Filters (Optional) View Selection Results

- LRO - LOLA GDRDAC [show details](#)
- LRO - LOLA GDRDAM [show details](#)
- LRO - LOLA SLDEM [show details](#)
- LRO - LROC CDRWAV [show details](#)
- LRO - LROC CDRWAU [show details](#)
- LRO - LROC CDRWAM [show details](#)
- LRO - LROC CDRWAC [show details](#)
- LRO - LROC CDRNAC [show details](#)
- LRO - LROC SDNDTM [show details](#)
- LRO - LROC MDRWVS [show details](#)
- LRO - LROC MDRWUV [show details](#)
- LRO - LROC BDRWMV [show details](#)
- LRO - LROC BDRWGL [show details](#)
- LRO - LROC BDRROI [show details](#)
- LRO - LROC BDRNPL [show details](#)
- LRO - LROC MDREMP [show details](#)
- LRO - LROC SDWDTM [show details](#)
- LRO - LROC EDRWAV [show details](#)
- LRO - LROC EDRWAU [show details](#)
- LRO - LROC EDRWAM [show details](#)
- LRO - LROC EDRWAC [show details](#)
- LRO - LROC EDRNAC [show details](#)
- LRO - MRFLRO CDR [show details](#)
- LRO - MRFLRO BSRDR [show details](#)
- LRO - MRFLRO BSDDR [show details](#)
- LRO - MRFLRO BSEDR [show details](#)
- LRO - MRFLRO MAPCDR [show details](#)
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- LRO - MRFLRO MOSDDR [show details](#)
- GRAIL - LGRS RDR [show details](#)
- CH1-ORB - M3 CALIMG [show details](#)
- CH1-ORB - M3 CALIV2 [show details](#)
- CH1-ORB - M3 CALIV3 [show details](#)
- CH1-ORB - M3 REFIMG [show details](#)

A cylindrical map of the Moon showing data coverage areas. The map is primarily blue, with some green areas. A vertical scale bar is visible on the left side of the map. The map is overlaid with a grid.

Nasa's Orbiter Data Explorer (ODE)



Home Data Product Search Map Search Tools Data Set Browser Download Help & Resources

Lunar ODE Map Interface - Cylindrical Center 0

Zoom In Zoom Out Full Extent Prev Extent Next Extent Pan Select Products By Area Remove Area Selection Select Projection Map Help

Map Display Controls

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- LRO - LOLA GDRDAC [show details](#)
- LRO - LOLA GDRDAM [show details](#)
- LRO - LOLA SLDEM [show details](#)
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- LRO - LROC CDRWAC [show details](#)
- LRO - LROC CDRNAC [show details](#)
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- LRO - LROC BDRWGL [show details](#)
- LRO - LROC BDRROI [show details](#)
- LRO - LROC BDRNPL [show details](#)
- LRO - LROC MDREMP [show details](#)
- LRO - LROC SDWDTM [show details](#)
- LRO - LROC EDRWAV [show details](#)
- LRO - LROC EDRWAU [show details](#)
- LRO - LROC EDRWAM [show details](#)
- LRO - LROC EDRWAC [show details](#)
- LRO - LROC EDRNAC [show details](#)
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- LRO - MRFLRO BSRDR [show details](#)
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- CH1-ORB - M3 REFIMG [show details](#)

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Zoom In Zoom Out Full Extent Prev Extent Next Extent Pan Select Products By Area Remove Area Selection Select Projection Map Help

Map Display Controls

Select Layers Set Filters (Optional) View Selection Results

SELECTION RESULTS SUMMARY

Product Type	Search Results Count
CH1-ORB M3 CALIV3	5
CLEM UVVIS EDR	223
LRO LROC CDRNAC	78
Total Products Found	306

SELECTION RESULTS LIST

Output Results ?

View in Table



Add All Results to Cart

Update Cart

Products Found: 306

Display Product Thumbnails

1 2 3 4

Instrument	Product ID
CH1-ORB M3 CALIV3	M3G20090418T190900_V03_RDN <input type="checkbox"/>
CH1-ORB M3 CALIV3	M3G20090516T040653_V03_RDN <input type="checkbox"/>
CH1-ORB M3 CALIV3	M3G20090516T040653_V03_RDN <input type="checkbox"/>
CH1-ORB M3 CALIV3	M3G20090612T101600_V03_RDN <input type="checkbox"/>
CH1-ORB M3 CALIV3	M3G20090612T143522_V03_RDN <input type="checkbox"/>
CLEM UVVIS EDR	 LUA2682K.187 <input type="checkbox"/>
CLEM UVVIS EDR	 LUA2683K.187 <input type="checkbox"/>

Archives 201

ACT Quick Map

Quick Map (ACT for the Moon and Mercury)



Tool developed by the company Applied Coherent Technology to explore datasets of the **Moon and Mercury**.

Search is done by

- **missions**
- **instruments**
- **versions of datasets (calibrated, raw, derived products)**
- **spatial location**

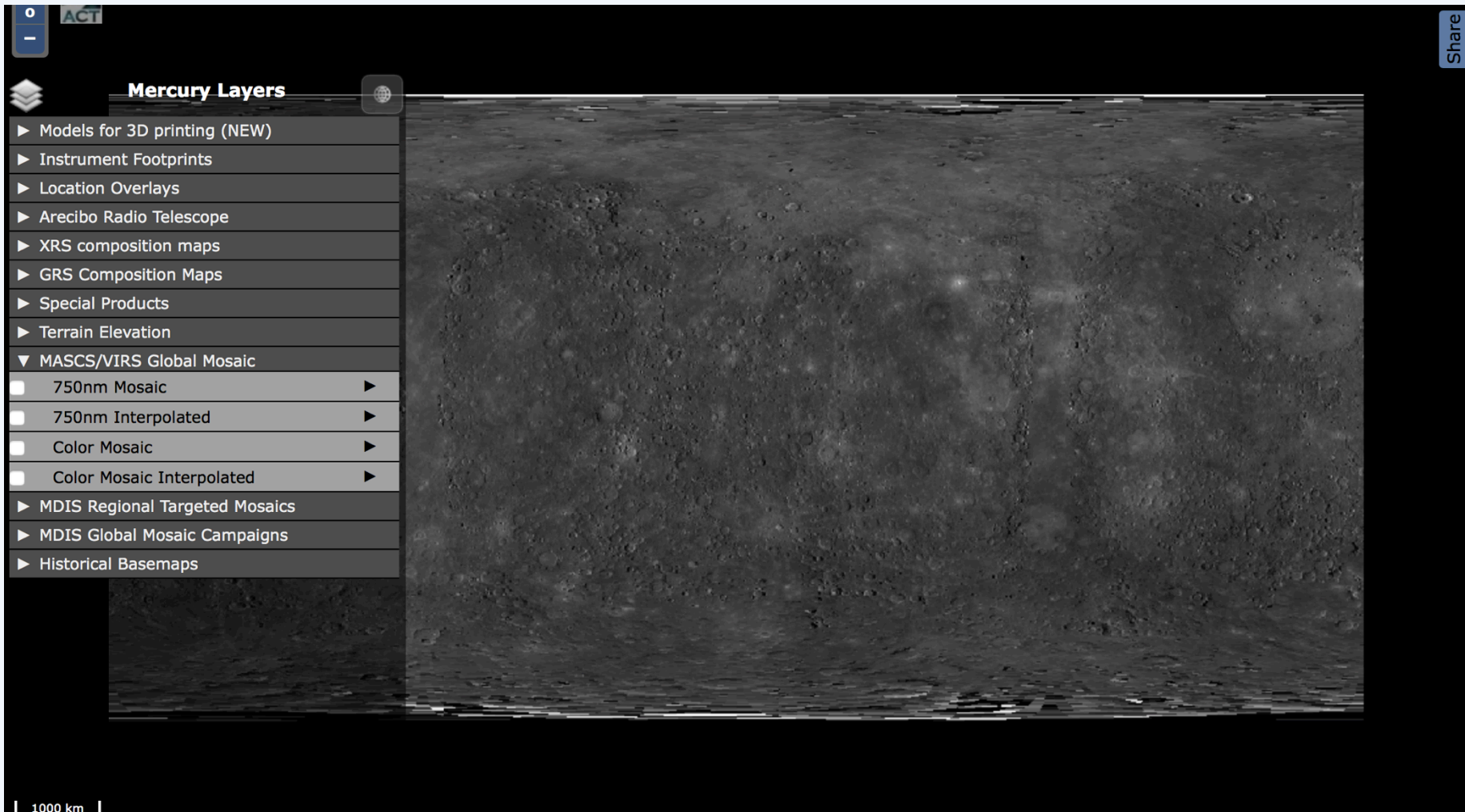
The tool is highly oriented towards Lunar Reconnaissance Orbiter (and the camera system) and also towards MESSENGER.

If this is your field, those tools are extremely useful.

<http://messenger-act.actgate.com>

<http://target.lroc.asu.edu/q3/>

Quick Map (ACT for the Moon and Mercury)



ACT

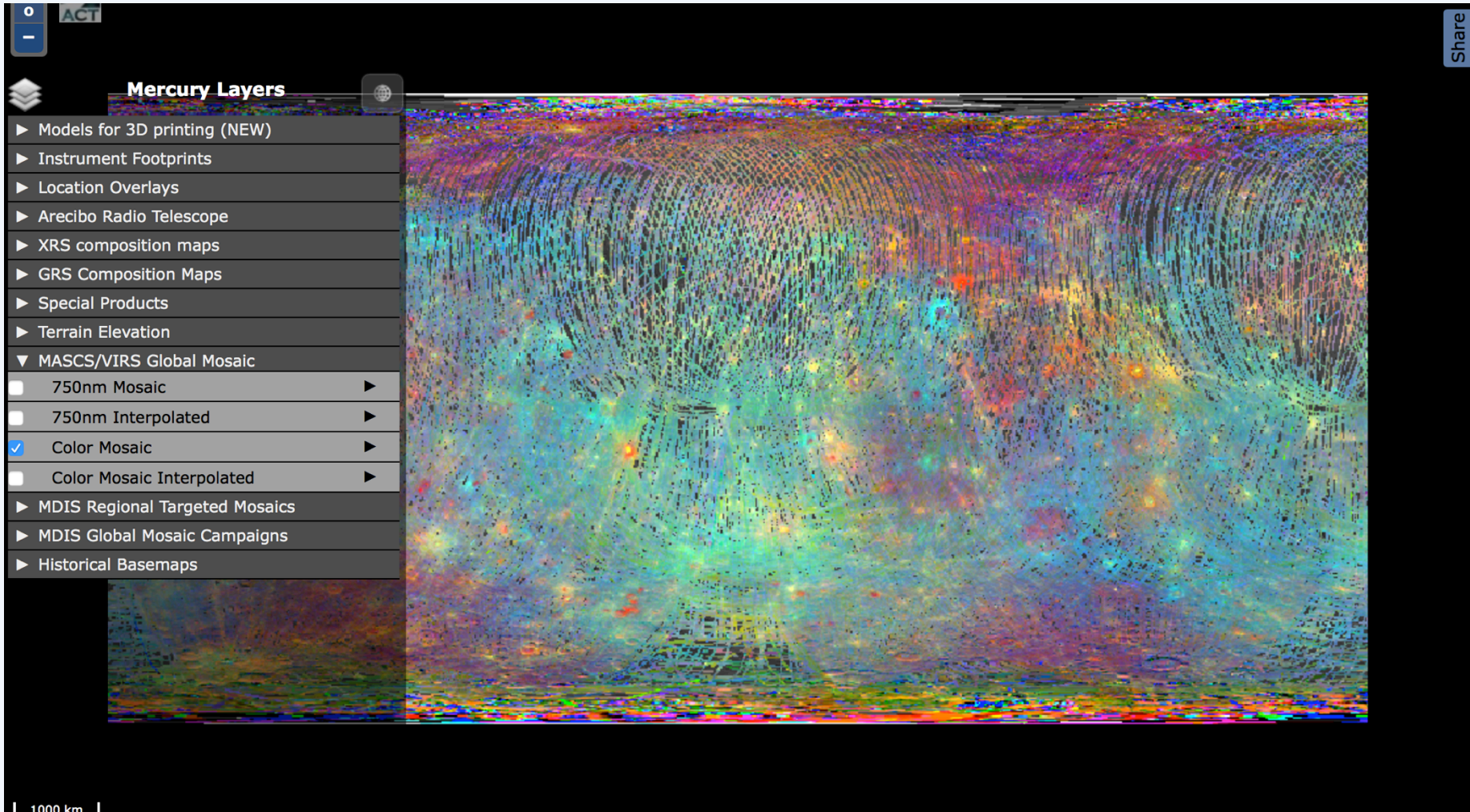
Share

Mercury Layers

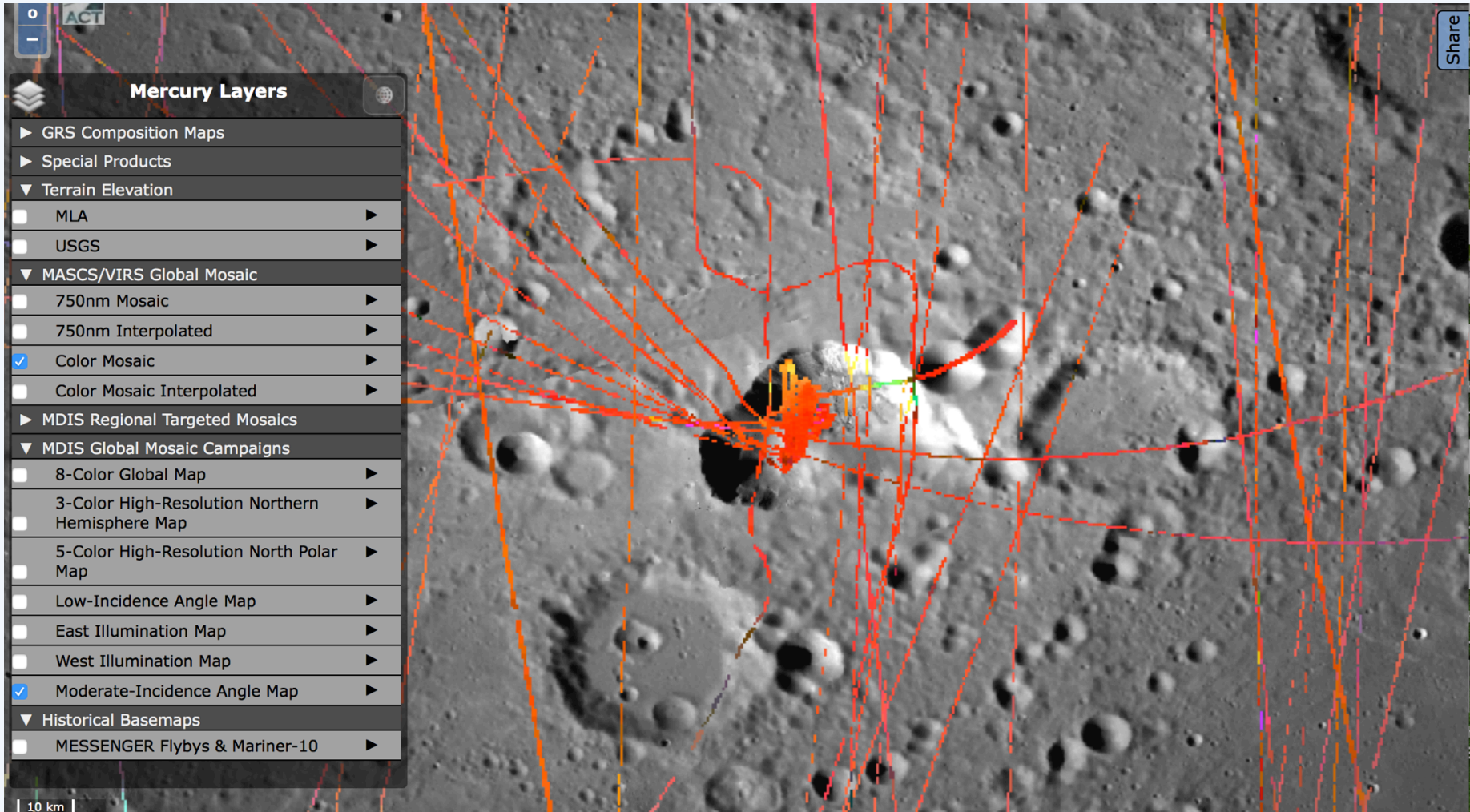
- ▶ Models for 3D printing (NEW)
- ▶ Instrument Footprints
- ▶ Location Overlays
- ▶ Arecibo Radio Telescope
- ▶ XRS composition maps
- ▶ GRS Composition Maps
- ▶ Special Products
- ▶ Terrain Elevation
- ▼ MASCS/VIRS Global Mosaic
 - 750nm Mosaic ▶
 - 750nm Interpolated ▶
 - Color Mosaic ▶
 - Color Mosaic Interpolated ▶
- ▶ MDIS Regional Targeted Mosaics
- ▶ MDIS Global Mosaic Campaigns
- ▶ Historical Basemaps

1000 km

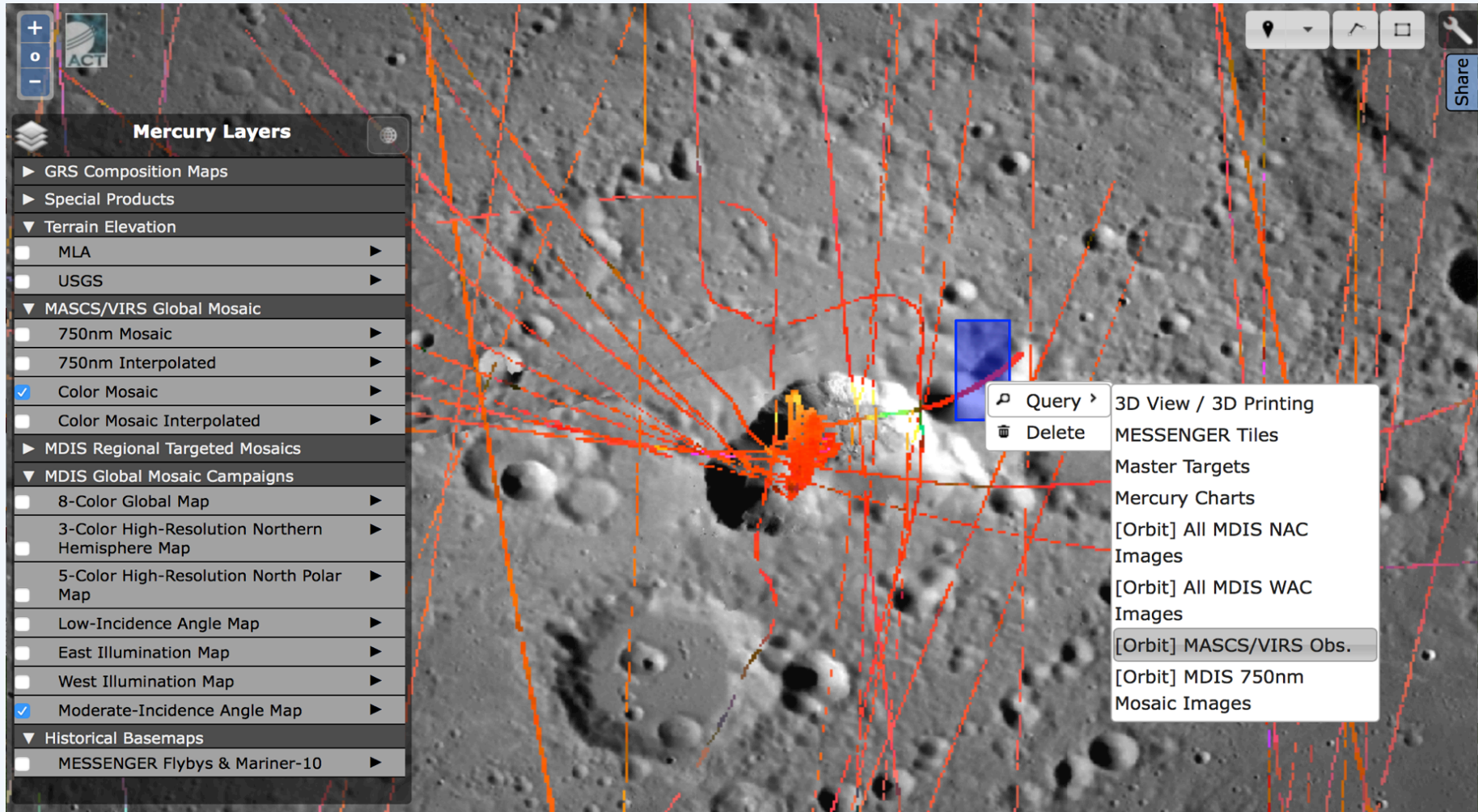
Quick Map (ACT for the Moon and Mercury)



Quick Map (ACT for the Moon and Mercury)



Quick Map (ACT for the Moon and Mercury)



Mercury Layers

- ▶ GRS Composition Maps
- ▶ Special Products
- ▼ Terrain Elevation
 - MLA
 - USGS
- ▼ MASC/VIRS Global Mosaic
 - 750nm Mosaic
 - 750nm Interpolated
 - Color Mosaic
 - Color Mosaic Interpolated
- ▶ MDIS Regional Targeted Mosaics
- ▼ MDIS Global Mosaic Campaigns
 - 8-Color Global Map
 - 3-Color High-Resolution Northern Hemisphere Map
 - 5-Color High-Resolution North Polar Map
 - Low-Incidence Angle Map
 - East Illumination Map
 - West Illumination Map
 - Moderate-Incidence Angle Map
- ▼ Historical Basemaps
 - MESSENGER Flybys & Mariner-10

Context Menu:

- Query
- Delete
- 3D View / 3D Printing
- MESSENGER Tiles
- Master Targets
- Mercury Charts
- [Orbit] All MDIS NAC Images
- [Orbit] All MDIS WAC Images
- [Orbit] MASC/VIRS Obs.
- [Orbit] MDIS 750nm Mosaic Images

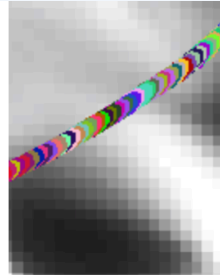
Quick Map (ACT for the Moon and Mercury)

ACT

Mercury Layers

- ▶ GRS Composition Maps
- ▶ Special Products
- ▼ Terrain Elevation
 - MLA ▶
 - USGS ▶
- ▼ MASCS/VIRS Global Mosaic
 - 750nm Mosaic ▶
 - 750nm Interpolated ▶
 - Color Mosaic ▶
 - Color Mosaic Interpolated ▶
- ▶ MDIS Regional Targeted Mosaics
- ▼ MDIS Global Mosaic Campaigns
 - 8-Color Global Map ▶
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 - West Illumination Map ▶
 - Moderate-Incidence Angle Map ▶
- ▼ Historical Basemaps
 - MESSENGER Flybys & Mariner-10 ▶

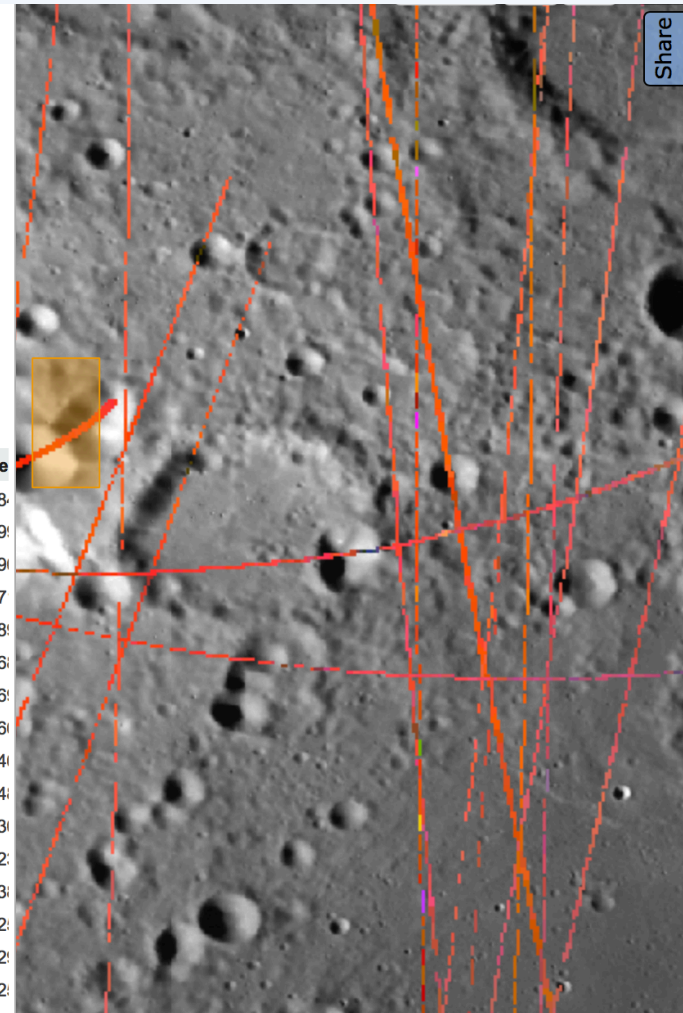
10 km



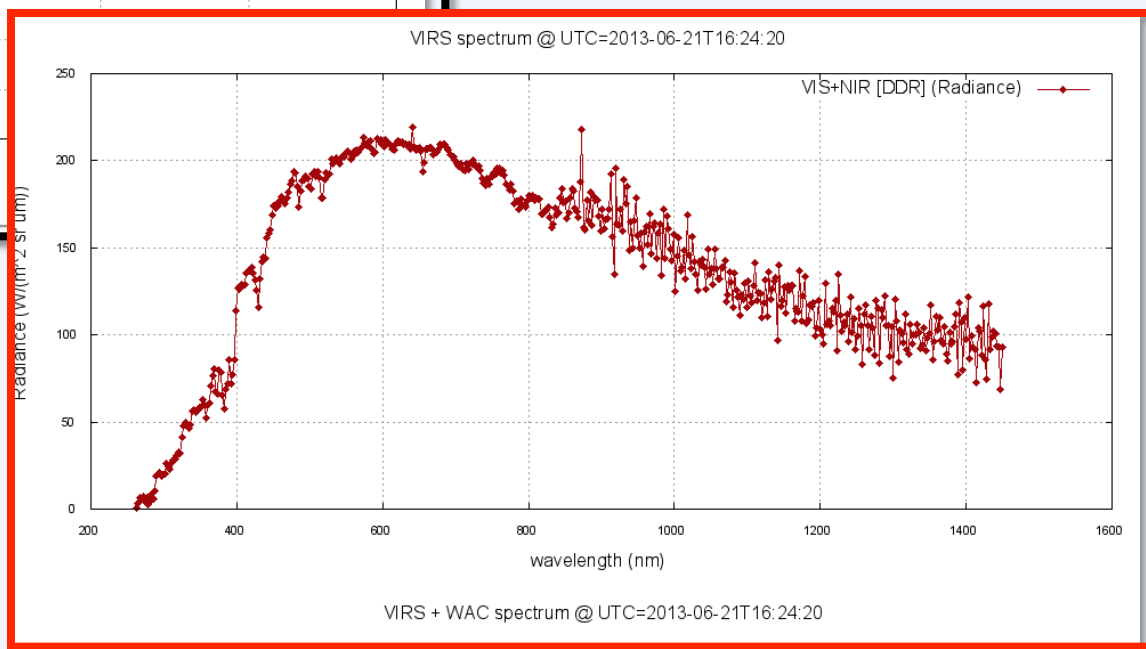
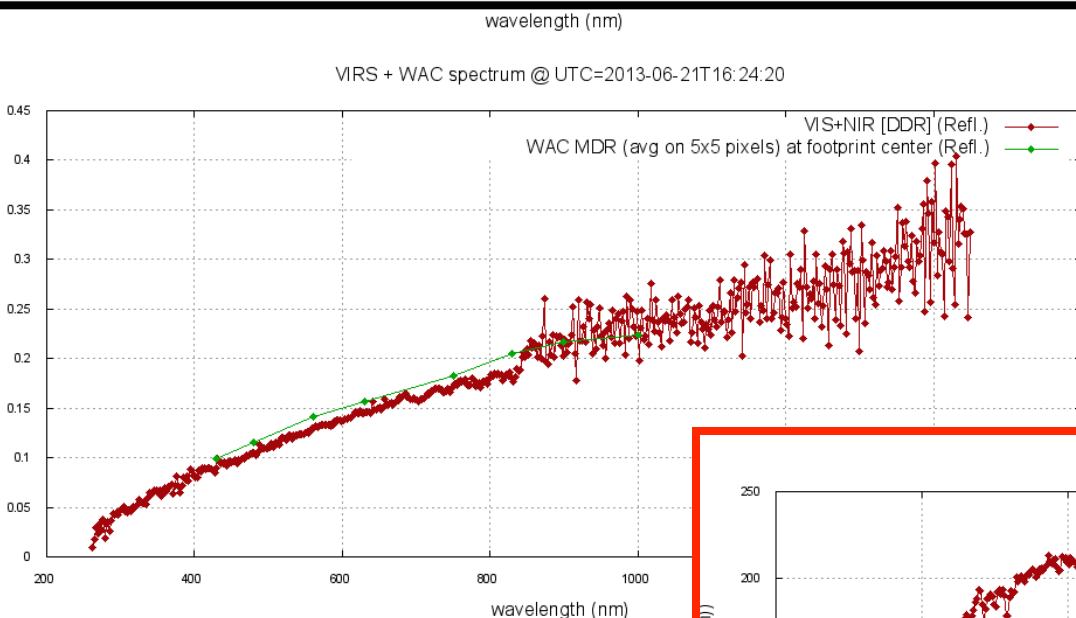
(click footprints or links to access detailed information)

VIRS footprints within ROI (limited to 50 records):

MET	UTC	I(avg)	E(avg)	P(avg)	area(km ²)	me
14155859.224	13172T16:24:20	58.86	58.83	77.83	1.56	5.8
14155860.474	13172T16:24:21	58.86	58.77	77.84	1.60	5.9
14155861.724	13172T16:24:22	58.87	58.72	77.83	1.58	5.9
14155862.974	13172T16:24:23	58.87	58.67	77.83	1.54	5.7
14155864.224	13172T16:24:25	58.87	58.61	77.83	1.59	5.8
14155865.474	13172T16:24:26	58.87	58.56	77.83	1.53	5.6
14155866.724	13172T16:24:27	58.87	58.50	77.83	1.54	5.6
14155867.974	13172T16:24:28	58.87	58.45	77.83	1.53	5.6
14155869.224	13172T16:24:30	58.87	58.39	77.83	1.48	5.4
14155870.474	13172T16:24:31	58.87	58.34	77.83	1.49	5.4
14155871.724	13172T16:24:32	58.88	58.29	77.83	1.44	5.3
14155872.974	13172T16:24:33	58.88	58.23	77.84	1.42	5.2
14155874.224	13172T16:24:35	58.88	58.18	77.84	1.47	5.3
14155875.474	13172T16:24:36	58.88	58.12	77.84	1.43	5.2
14155876.724	13172T16:24:37	58.88	58.06	77.84	1.45	5.2
14155877.974	13172T16:24:38	58.88	58.01	77.84	1.44	5.2



Quick Map (ACT for the Moon and Mercury)



inspect the plotted values as: [CSV](#)

et	425103926.85596174000000
met	2/14155859:224000
tint	1.0000000000000000
SC2TPctrD	3936.891701709999800
SubSCLAT	12.423678219999999
SubSCLON	51.044421679999999
NADIR_ALT	1498.343940720000100
SubSolLAT	-0.016418920000000

S.

:3

Same request with ODE Moon

Home Data Product Search Map Search Tools Data Set Browser Download Help & Resources

Mercury ODE Map Interface - Cylindrical Center 0

Zoom In Zoom Out Full Extent Prev Extent Next Extent Pan Select Products By Area Remove Area Selection Select Projection Map Help

Map Display Controls

Select Layers Set Filters (Optional) View Selection Results

SELECTION RESULTS SUMMARY

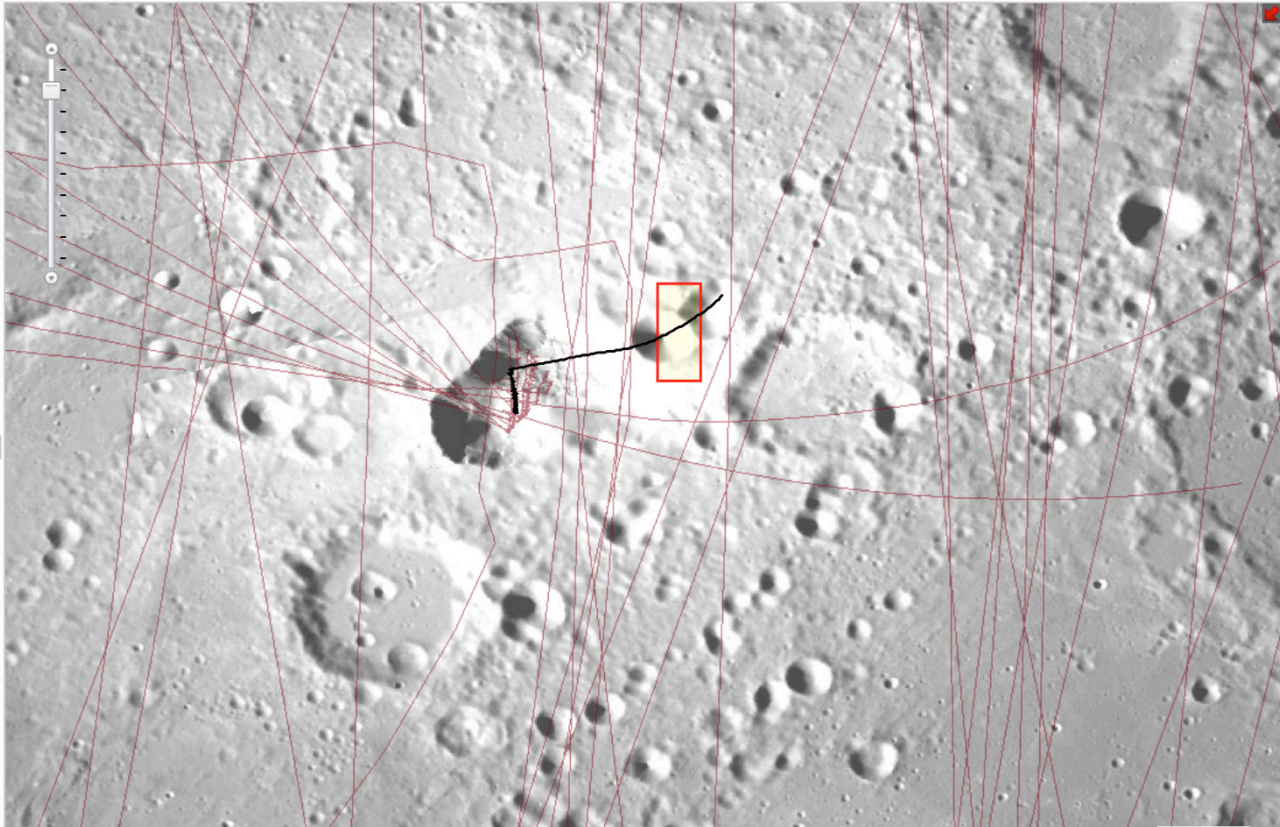
Product Type	Search Results Count
MESSENGER MASCS VIRCDR	2
Total Products Found	2

SELECTION RESULTS LIST

Output Results View in Table Add All Results to Cart Update Cart

Products Found: 2
 Display Product Thumbnails

Instrument	Product ID
MESSENGER MASCS VIRCDR	VIRSNC_OB3_13172_162409_DAT
MESSENGER MASCS VIRCDR	VIRSV_C_OB3_13172_162409_DAT



Archives 201

SPIICE tools from NASA @ ESA

This is a tool that will help you find **specific conditions** (i.e., geometry) and narrow down searches not always possible with archives

1. You can find if an object is in the field of view at a given time
2. You can find some geometric conditions that are suitable for your science goal
3. From that you can narrow down a time-search interval that will be used in the archive system you are exploring (providing it gives you the opportunity to select time)
4. <http://spice.esac.esa.int/webgeocalc/#NewCalculation>
5. <http://wgc.jpl.nasa.gov:8080/webgeocalc/#NewCalculation>

ESA and NASA planetary science missions use SPICE. It also starts to be used in Astronomy and Heliophysics 😊

Archives 201

ESA Planetary Science Archive

Planetary Science Archive (PSA)

- Repository of ESA' missions for exploration of the Solar System
- It contains science datasets, as well as engineering datasets of spacecrafts and instruments
- It uses a common format with other international planetary missions, the Planetary Data System format (PDS)
- PSA has the commitment to provide access to ESA' missions scientific and engineering datasets for decades to the public.

The Planetary Science Archive structure



ESA DIRECTORATE OF SCIENCE

Scientific Support Office (ESTEC)

Science Operations Department (ESAC)

PSA Actors

Scientific Community

PSA Actors

Project Scientists

Mars Express
Rosetta
BepiColombo
Juice
ExoMars 2016
ExoMars RSP

Science Operations Division

PSA Actors

Science Ground Segment & Archive Scientist

Mars Express
Rosetta
ExoMars 2016

Science Data & Engineering Division

PSA Actors

ESAC Science Data Centre

Planetary Science Archive

Science Lead

Technical Lead

PSA Development Team

Science Operations Development Division

PSA Actors

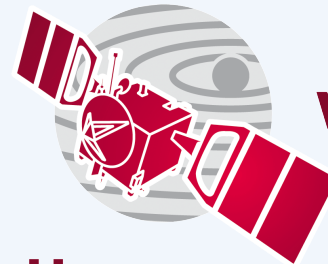
Science Ground Segment & Archive Scientist

BepiColombo
Juice
ExoMars RSP

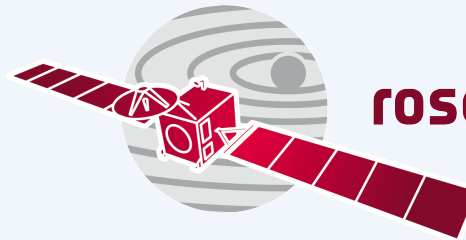
Planetary Science Archive



bepicolombo



venus express



rosetta



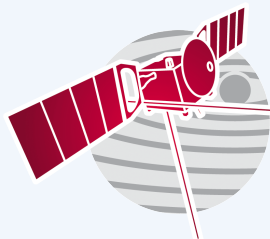
giotto



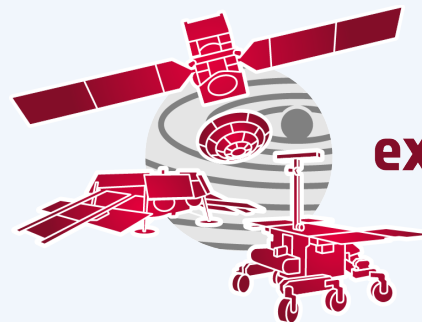
cassini-huygens



smart-1

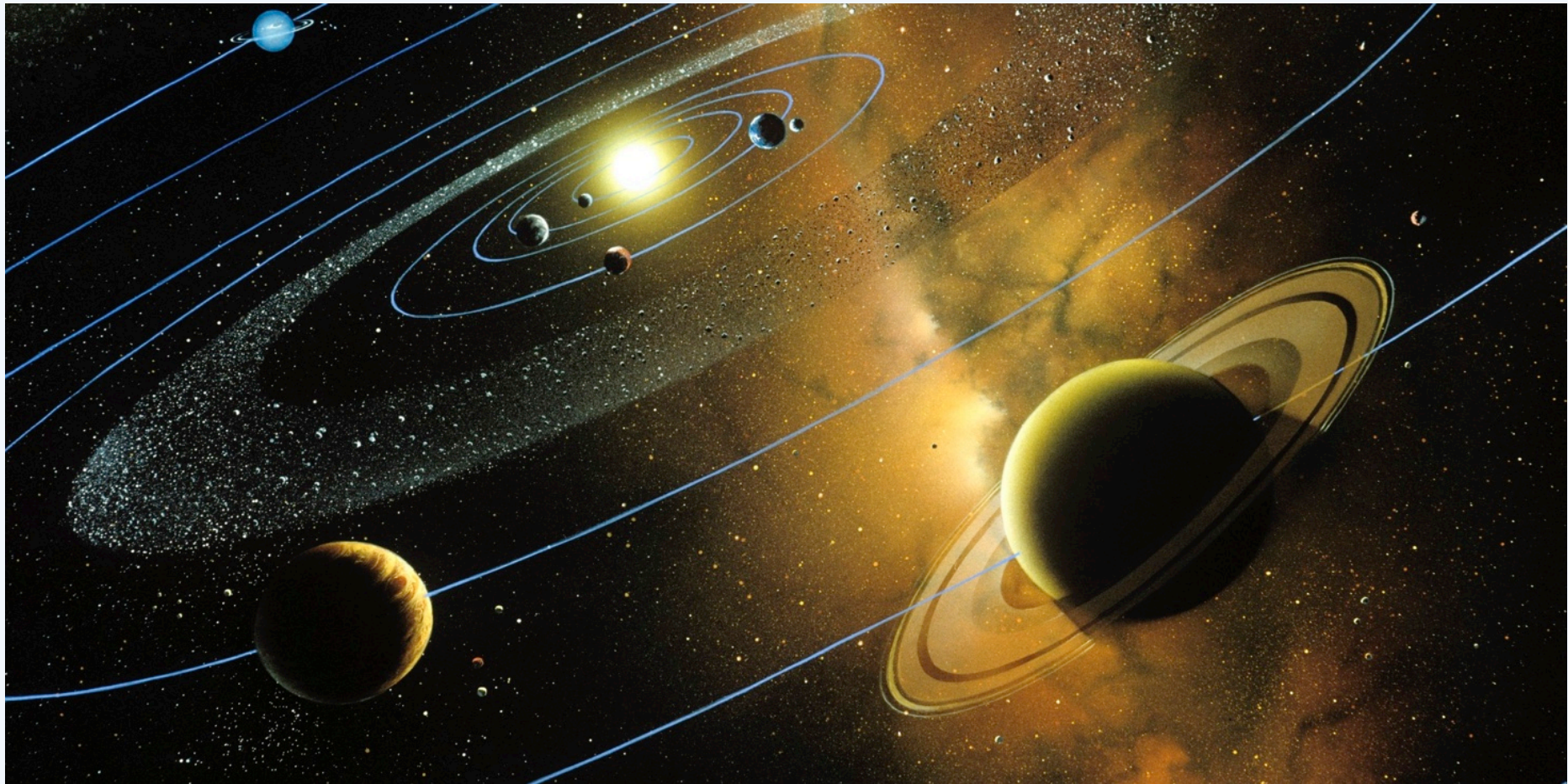


mars express



exomars

We work at redshift **0.0000000000000001**



To Whom are we providing services ?

1- Missions in operation

- Quick view of datasets, secured interface for sharing products

2- Scientists to perform their research

- Reliable peer-reviewed science ready data
- Interface to search their favourite datasets

3- Public, teachers, journalists, and anybody that needs science datasets

- Facilitate access to public datasets
- Disseminate the exploration of the universe

Services provided to the community

1. FTP repository with all datasets
2. Search interfaces (Metadata, maps)
3. Documentations
4. Ancillary datasets
5. Workshop and training
6. Support in the creation of archive compliant datasets

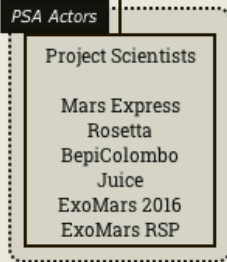
→ THIS IS CHANGING DRAMATICALLY !!!

PSA Changes



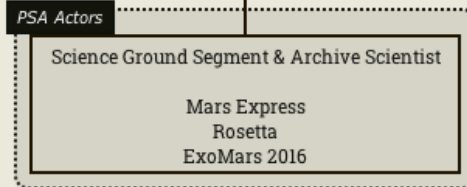
ESA DIRECTORATE OF SCIENCE

Scientific Support Office (ESTEC)

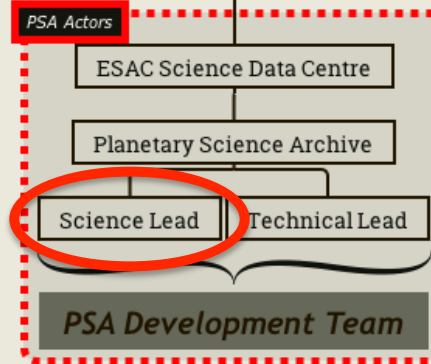


Science Operations Department (ESAC)

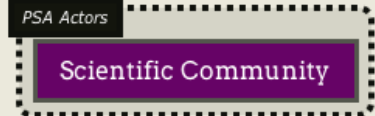
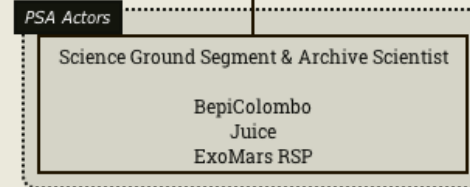
Science Operations Division



Science Data & Engineering Division



Science Operations Development Division



The PSA 5.0 will improve and increase significantly the quality of the services

1. Will continue to provide the same services, improved with a new hardware, new interface and thin layer access
2. New service with the **GIS technology** to visualize the datasets in context (projected into the surface, registration of observations, etc.)
3. Improved metadata to select datasets with specific conditions (geometry of observations, timing, etc..)
4. Maximize the **interoperability** and **comparison** with other archives (possibility to confront BepiColombo with MESSENGER products)
5. Facilitate datasets access for scientists, make products from science missions more affordable (and all of that for free!)

To do these changes, we rely on

1. The PSA team: Archive Scientists, Archive Engineers
2. All ESA interested parties can/should propose ideas
 - Tell us what you found interesting in other archives
 - Tell us yours needs to obtain the science datasets
 - Tell us what you think will make PSA better
3. The scientific community, represented at the PSA by the PSA User Group (E. Hauber, S. Fornasier, A. Munoz, P. Tortora, J. Soucek, F. Altieri, E. Sefton-Nash)
4. Whoever as something to say !!!

We will make your life easier to explore the Solar System

1. You will be able to search for a specific products, make sure it is the one you need before you have to download it
2. You will be able to compare it to products of other missions to see if that is the product you want
3. You will be able to combine scientific datasets with spacecraft and engineering products if needed
4. In two minutes, you will get what you want (providing you know what you want !)

Step 1 – Arrive at PSA

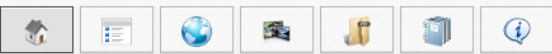


planetary science archive

PSA 5.0 RC3



[HOME](#)



PSA

START SEARCHING YOUR DATASET!

NAVCAM [instrument]

SPICAM [instrument]

The European Space Agency's Planetary Science Archive (PSA) currently includes data returned by ESA's Solar System missions: currently including Giotto, Huygens, Mars Express, Mars Global Surveyor, Mars Reconnaissance Orbiter, Mars Odyssey, Mars Science Laboratory, Mars Express, and Mars Reconnaissance Orbiter. Future missions such as ExoMars 16, ExoMars 18, and BepiColombo will also be hosted in the PSA. The PSA uses Planetary Data System standards as a baseline for the formatting and structure of all data contained within the archive... Learn more [HERE](#).

...engineering data returned by ESA's Solar System missions: currently including Giotto, Huygens, Mars Express, Mars Global Surveyor, Mars Reconnaissance Orbiter, Mars Odyssey, Mars Science Laboratory, Mars Express, and Mars Reconnaissance Orbiter. Future missions such as ExoMars 16, ExoMars 18, and BepiColombo will also be hosted in the PSA. The PSA uses Planetary Data System standards as a baseline for the formatting and structure of all data contained within the archive... Learn more [HERE](#).

DATA ACCESS



TABLE VIEW



MAP VIEW



FTP ACCESS



IMAGE VIEW

PRODUCT INFO & TOOLS



ANCILLARY DATA



TOOLS



DOCUMENTATION



ESA MISSIONS

USEFUL INFORMATION



WORKSHOP



USER GROUP



HELP & FAQ



CONTACT

Step 2 – Result of initial query

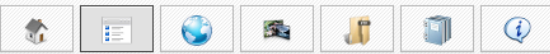


planetary science archive

PSA 5.0 RC3



TABLE VIEW



Show All Hide All

Filter



Missions

Targets

Instruments

- NAVCAM
- NOMAD
- OMEGA
- OPE
- OSIRIS
- PFS
- Phebus
- PHOT

Instruments Types

Time

Processing Level

Free Search

Type your CQL query here...

	Postcard	Product Identifier	Observation Start Time	Observation Stop Time	Target	Mission	Instrument	Processing Level
<input type="checkbox"/>		ROS_CAM1_20150310T232252	2015-03-10 23:22:52	2015-03-10 23:22:53	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T232252F	2015-03-10 23:22:52	2015-03-10 23:22:53	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T231832	2015-03-10 23:18:32	2015-03-10 23:18:33	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T231832F	2015-03-10 23:18:32	2015-03-10 23:18:33	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T230852	2015-03-10 23:08:52	2015-03-10 23:08:53	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T230852F	2015-03-10 23:08:52	2015-03-10 23:08:53	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T230432	2015-03-10 23:04:32	2015-03-10 23:04:33	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T230432F	2015-03-10 23:04:32	2015-03-10 23:04:33	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T220002	2015-03-10 22:00:02	2015-03-10 22:00:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T220002F	2015-03-10 22:00:02	2015-03-10 22:00:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T200002	2015-03-10 20:00:02	2015-03-10 20:00:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T200002F	2015-03-10 20:00:02	2015-03-10 20:00:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T183443	2015-03-10 18:34:43	2015-03-10 18:34:44	67P/C-G	Rosetta	NAVCAM	2

Step 3 – refine query, downloading products

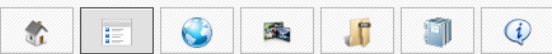


planetary science archive

PSA 5.0 RC3



TABLE VIEW



[Show All](#) [Hide All](#)



Missions [?](#)

Targets [?](#)

Instruments [?](#)

- MARSIS
- MIDAS
- MIRO
- More
- MPO-MAG
- NAVCAM
- NOMAD
- OMEGA

Instruments Types [?](#)

Time [?](#)

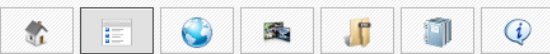
Processing Level [?](#)

<input type="checkbox"/>	Postcard	Product Identifier	Observation Start Time	Observation Stop Time	Target	Mission	Instrument	Processing Level
<input type="checkbox"/>		ROS_CAM1_20150310T173002	2015-03-10 17:30:02	2015-03-10 17:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T173002F	2015-03-10 17:30:02	2015-03-10 17:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T153002	2015-03-10 15:30:02	2015-03-10 15:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T153002F	2015-03-10 15:30:02	2015-03-10 15:30:02	67P/C-G	Rosetta	NAVCAM	2

Step 3 – refine query, downloading products



TABLE VIEW



▼ Show All ▲ Hide All

Filter



Missions ▼ ?

Targets ▼ ?

Instruments ▲ ?

- MARSIS
- MIDAS
- MIRO
- More
- MPO-MAG
- NAVCAM
- NOMAD
- OMEGA

Instruments Types ▼ ?

Time ▲ ?

2015-03-10 15:00:00

2015-03-10 17:59:59

Processing Level ▼ ?

<input type="checkbox"/>	Postcard	Product Identifier	Observation Start Time ▼	Observation Stop Time	Target	Mission	Instrument	Processing Level
<input type="checkbox"/>		ROS_CAM1_20150310T173002	2015-03-10 17:30:02	2015-03-10 17:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T173002F	2015-03-10 17:30:02	2015-03-10 17:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20150310T153002	2015-03-10 15:30:02	2015-03-10 15:30:02	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20150310T153002F	2015-03-10 15:30:02	2015-03-10 15:30:02	67P/C-G	Rosetta	NAVCAM	2

- ▼ RO-C-NAVCAM-2-ESC1-MTP013-V1.0 --
- ▼ DATA --
- ▼ CAM1 --
- ROS_CAM1_20150310T220002.IMG 2,1 MB
- ROS_CAM1_20150310T220002.JPG 1 KB
- ROS_CAM1_20150310T220002.LBL 9 KB

Crossed mission searches

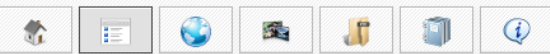


planetary science archive

PSA 5.0 RC3



TABLE VIEW



Show All Hide All



Missions

- Mars Express
- Rosetta

Targets

Instruments

Instruments Types

Time

2014-06-29 00:00:00

2014-06-29 23:59:59

Processing Level

<input type="checkbox"/>	Postcard	Product Identifier	Observation Start Time	Observation Stop Time	Target	Mission	Instrument	Processing Level
<input type="checkbox"/>		ROS_CAM1_20140629T092947	2014-06-29 09:29:47	2014-06-29 09:29:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20140629T092947F	2014-06-29 09:29:47	2014-06-29 09:29:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20140629T092747	2014-06-29 09:27:47	2014-06-29 09:27:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20140629T092747F	2014-06-29 09:27:47	2014-06-29 09:27:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20140629T092547	2014-06-29 09:25:47	2014-06-29 09:25:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20140629T092547F	2014-06-29 09:25:47	2014-06-29 09:25:47	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		ROS_CAM1_20140629T092348	2014-06-29 09:23:47	2014-06-29 09:23:49	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>	N/A	ROS_CAM1_20140629T092348F	2014-06-29 09:23:47	2014-06-29 09:23:49	67P/C-G	Rosetta	NAVCAM	2
<input type="checkbox"/>		HD323_0000_S23.IMG	2014-06-29 04:41:57	2014-06-29 04:45:11	Mars	Mars Express	HRSC	3
<input type="checkbox"/>		HD323_0000_RE3.IMG	2014-06-29 04:41:37	2014-06-29 04:44:51	Mars	Mars Express	HRSC	3
<input type="checkbox"/>		HD323_0000_P23.IMG	2014-06-29 04:41:17	2014-06-29 04:44:30	Mars	Mars Express	HRSC	3
<input type="checkbox"/>		HD323_0000_BL3.IMG	2014-06-29 04:40:16	2014-06-29 04:43:29	Mars	Mars Express	HRSC	3
<input type="checkbox"/>		HD323_0000_ND3.IMG	2014-06-29 04:39:54	2014-06-29 04:43:07	Mars	Mars Express	HRSC	3

Interactions of filters



TABLE VIEW

Navigation icons: Home, Lists, Earth, Images, Documents, Settings, Help

Buttons: Show All, Hide All

Search: Filter

Actions: Check, Download, Print

Targets

- 1P/Halley
- 26P/Grigg-Skjellerup

Instruments

- DID
- GRE
- HMC
- IMS
- JPA
- MAG (Giotto)
- OPE
- PIA

Instruments Types

- DUST IMPACT DETECTOR

	Postcard	Product Identifier	Observation Start Time	Observation Stop Time	Target	Mission	Instrument
<input type="checkbox"/>		HMC02007	1986-03-14 00:02:02	1986-03-14 00:02:02	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:58	1986-03-14 00:01:58	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:58	1986-03-14 00:01:58	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:58	1986-03-14 00:01:58	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:54	1986-03-14 00:01:54	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:54	1986-03-14 00:01:54	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:54	1986-03-14 00:01:54	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:50	1986-03-14 00:01:50	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:50	1986-03-14 00:01:50	1P/Halley	Giotto	
<input type="checkbox"/>			1986-03-14 00:01:50	1986-03-14 00:01:50	1P/Halley	Giotto	

HMC02007

HMC02007

Summary | Geometry | Products | Documents

Product Identifier	HMC02007
Start Time	1986-03-14 00:01:54
Stop Time	1986-03-14 00:01:54
Target	1P/Halley
Mission	Giotto
Instrument	HMC
Processing Level	3
Instrument host	--

Page: 1 42 > >> Items/page: 50 Displaying 1 - 50 of 2054

Customise your interface



EUROPEAN SPACE AGENCY

SCIENCE & TECHNOLOGY

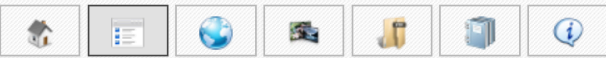
SIGN IN

planetary science archive

PSA 5.0 RC2



TABLE VIEW



Show All Hide All

Missions

- Giotto
- Ground Based
- Hubble
- Huygens
- Mars Express
- Rosetta
- SMART-1
- Venus Express

Targets

Instruments

Instruments Types

Time

Processing Level

<input type="checkbox"/>	Postcard	Product Identifier	Target	Observation Start Time	Mission	Instrument	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_13_T00	Moon	2004-11-12 23:00:18	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_13_T04	Moon	2004-11-12 23:00:02	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_12_T00	Moon	2004-11-11 23:00:18	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_12_T04	Moon	2004-11-11 23:00:02	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T02	--	2004-11-11 06:46:23	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T8A	--	2004-11-11 06:46:16	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T8B	--	2004-11-11 06:46:16	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T9A	--	2004-11-11 06:46:16	SMART-1	D-CIXS	
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T9B	--	2004-11-11 06:46:16	SMART-1	D-CIXS	2
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T04	--	2004-11-11 06:46:00	SMART-1	D-CIXS	2
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_11_T00	--	2004-11-11 06:01:38	SMART-1	D-CIXS	2
<input type="checkbox"/>	N/A	S1_DCIXS_2004_11_04_T00	--	2004-11-03 23:00:18	SMART-1	D-CIXS	2

Filter

Column Selector

- Product Identifier
- Observation Start Time
- Observation Stop Time
- Target
- Mission
- Instrument
- Processing Level
- Instrument Host
- Instrument Type
- Sub Instrument
- Version
- Product Title

All None

Page: 1 32 >>

Items/page: 50 Displaying 1 - 50 of 1555

More data → Go to the FTP



If you need more
then few data

You have the **FTP**

Everything is here

The screenshot shows a file explorer window titled 'mirror' with a table of folders. The table has columns for Name, Date Modified, Size, and Kind. The folders are organized into several groups, including Cassini-Huygens, Earth, International-Rosetta-Mission, Mars-Express, and Venus-Express.

Name	Date Modified	Size	Kind
▼ CASSINI-HUYGENS	16 Oct 2007 00:00	--	Folder
▶ ACP	03 Mar 2009 00:00	--	Folder
▶ DISR	16 Oct 2007 00:00	--	Folder
▶ DTWG	11 Jun 2011 00:00	--	Folder
▶ DWE	17 Oct 2006 00:00	--	Folder
▶ GCMS	03 Mar 2009 00:00	--	Folder
▶ HASI	18 Oct 2006 00:00	--	Folder
▶ HUYGENS_HK	17 Oct 2006 00:00	--	Folder
▶ SSP	27 Mar 2007 00:00	--	Folder
▶ EARTH	11 Sep 2009 00:00	--	Folder
▶ ExoMars2016	25 May 2016 15:58	--	Folder
▶ GIOTTO	17 Oct 2006 00:00	--	Folder
▶ HST	17 Oct 2006 00:00	--	Folder
▼ INTERNATIONAL-ROSETTA-MISSION	03 Jul 2015 00:00	--	Folder
▶ ALICE	14 Jan 2016 00:00	--	Folder
▶ CONSERT	24 Aug 2013 00:00	--	Folder
▶ COSAC	31 Jan 2014 00:00	--	Folder
▶ COSIMA	03 Dec 2015 00:00	--	Folder
▶ GIADA	09 Jul 2016 03:00	--	Folder
▶ MIDAS	15 Apr 2016 03:00	--	Folder
▶ MIRO	15 Aug 2016 03:00	--	Folder
▶ NAVCAM	29 Aug 2016 03:00	--	Folder
▶ OSINAC	28 Jun 2016 03:00	--	Folder
▶ OSIWAC	28 Jun 2016 03:00	--	Folder
▶ ROSINA	09 Jul 2016 08:24	--	Folder
▶ RPCICA	16 Jun 2016 03:00	--	Folder
▶ RPCIES	19 Apr 2016 03:00	--	Folder
▶ RPCLAP	25 May 2016 14:33	--	Folder
▶ RPCMAG	11 Jul 2016 12:27	--	Folder
▶ RPCMIP	31 Mar 2016 03:00	--	Folder
▶ RSI	14 Jan 2014 00:00	--	Folder
▶ SD2	05 Feb 2014 00:00	--	Folder
▶ SHAPE	15 Apr 2016 14:07	--	Folder
▶ SPICE	31 Mar 2016 10:00	--	Folder
▶ VIRTIS	05 Aug 2016 03:00	--	Folder
▶ MARS-EXPRESS	19 May 2009 00:00	--	Folder
▶ PSA	13 May 2016 12:36	--	Folder
▶ SMALL-MISSIONS-FOR-ADVANCED-RESEARCH-AND-TECHNOLOGY	20 Aug 2010 00:00	--	Folder
▶ VENUS-EXPRESS	15 Sep 2010 00:00	--	Folder

More informations on COSMOS



planetary science archive

PSA 5.0 RC3



PSA

START SEARCHING YOUR DATASET!

Type a Target, Mission or Instrument, such as Mars, Rosetta, Phebus...



The European Space Agency's Planetary Science Archive (PSA) is the central repository for all scientific and engineering data returned by ESA's Solar System missions: currently including Giotto, Huygens, Mars Express, Rosetta, SMART-1, and Venus Express, as well as several ground-based cometary observations. Future missions such as ExoMars 16, ExoMars 18, and BepiColombo will also be hosted in the PSA. The PSA uses Planetary Data System standards as a baseline for the formatting and structure of all data contained within the archive... Learn more [HERE](#).

DATA ACCESS



TABLE VIEW



MAP VIEW



FTP ACCESS



IMAGE VIEW

PRODUCT INFO & TOOLS



ANCILLARY DATA



TOOLS



DOCUMENTATION



ESA MISSIONS

USEFUL INFORMATION



WORKSHOP



USER GROUP



HELP & FAQ



CONTACT

A protected archive 😊



SIGN IN

HOME

EUROPEAN SPACE AGENCY SCIENCE & TECHNOLOGY

planetary science archive

PSA 5.0 RC3



PSA

START SEARCHING YOUR DATASET!

Type a Target, Mission or Instrument, such as Mars, Rosetta, Phebus...



The European Space Agency's Planetary Science Archive (PSA) is the central repository for all scientific and engineering data returned by ESA's Solar System missions: currently including Giotto, Huygens, Mars Express, Rosetta, SMART-1, and Venus Express, as well as several ground-based cometary observations. Future missions such as ExoMars 16, ExoMars 18, and BepiColombo will also be hosted in the PSA. The PSA uses Planetary Data System standards as a baseline for the formatting and structure of all data contained within the archive... Learn more [HERE](#).

DATA ACCESS



TABLE VIEW



MAP VIEW



FTP ACCESS



IMAGE VIEW

PRODUCT INFO & TOOLS



ANCILLARY DATA



TOOLS



DOCUMENTATION



ESA MISSIONS

USEFUL INFORMATION



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CONTACT

Summary of current status



1. Data from all the past missions and missions in operations are searchable by: Missions, Instruments, Targets, Time, Processing level, instrument types
2. Data can be sorted out by various criteria
3. Browse products can be seen in the interface, this helps in some case to identify if the product is useful for your purposes
→ Often not provided by the data provider
4. Information and help is provided through the PSA Cosmos website

What are the **UPCOMING** benefits for science

We are working on important updates

1. Image Gallery

→ Towards the scientific community

→ Towards the rest of the world

2. Geographical Information System (GIS)

→ Projection of products into the surfaces

Together with an improved reliability on all metadata of the products

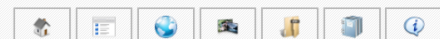
PSA is one general tool that offer and will offer different ways to search and visualize datasets

Image Gallery



planetary science archive

PSA 5.0 beta24



Show All Hide All

Sort by:

- Mission
- Target
- Product Title
- Processing Level
- Start Time
- Instrument

Number of results: 413

Missions

- BepiColombo
 - MPO
- ExoMars 2016
 - Lander
 - Orbiter
- Giotto
- Ground Based
 - BMO

Targets

Instruments

Instruments Types

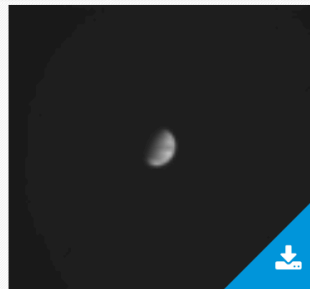
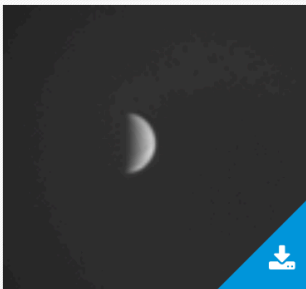
Time

Processing Level



Free Search

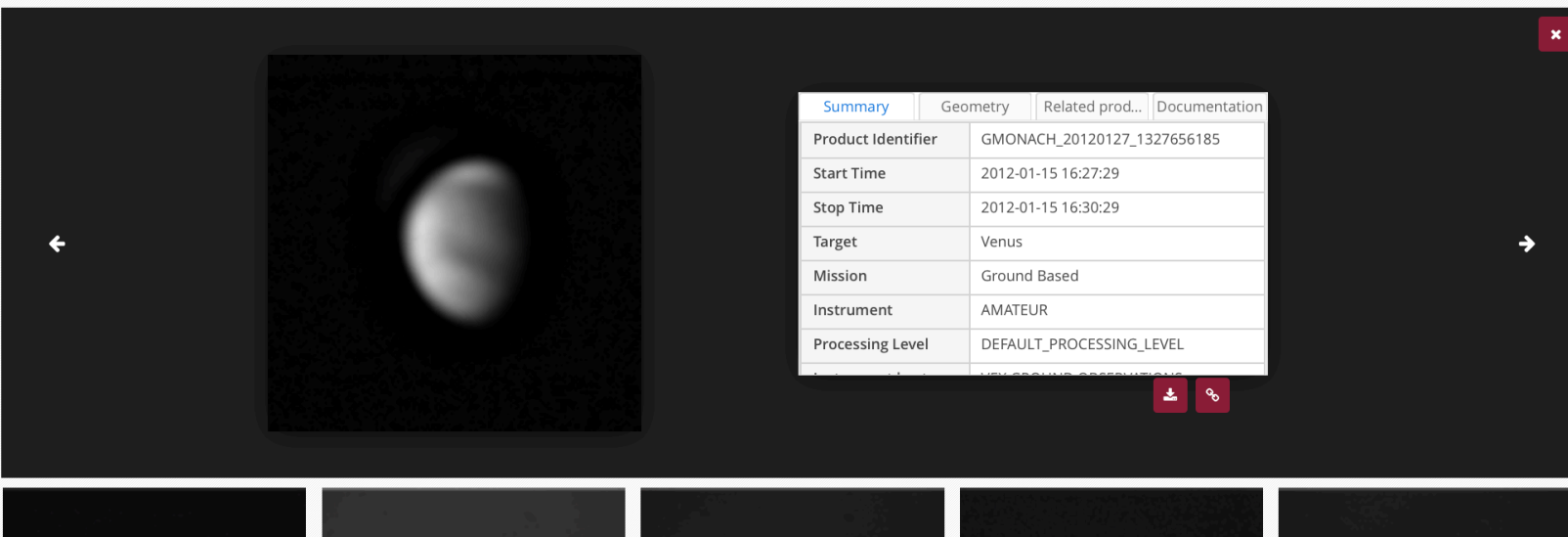
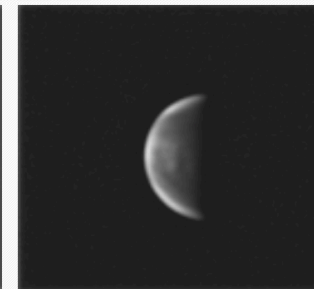
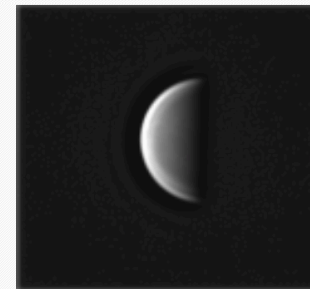
Free Search



PWELTER_20130710_1373489609

Mission: Ground Based
Target: Venus
Processing: DEFAULT_PROCESSING_LEV
Start time: 2013-07-06 18:27:02
Instrument: AMATEUR

ADD TO DOWNLOADS



Summary	Geometry	Related prod...	Documentation
Product Identifier	GMONACH_20120127_1327656185		
Start Time	2012-01-15 16:27:29		
Stop Time	2012-01-15 16:30:29		
Target	Venus		
Mission	Ground Based		
Instrument	AMATEUR		
Processing Level	DEFAULT_PROCESSING_LEVEL		



Geographical Information System (GIS)



The screenshot displays the Planetary Science Archive GIS interface. On the left, a sidebar contains layer controls for 'BASE MAP LAYERS' (MARS, MERCURY) and 'OVERLAY LAYERS' (FEATURE MARS, FOOTPRINTS 5 HRSC, Draw Polygon). Below these are search fields for features and footprints. The main map area shows a grayscale topographic map of Mars with several yellow rectangular footprint overlays. A scale bar at the bottom left indicates 500 km. A 'Footprint' metadata window is open, displaying the following information:

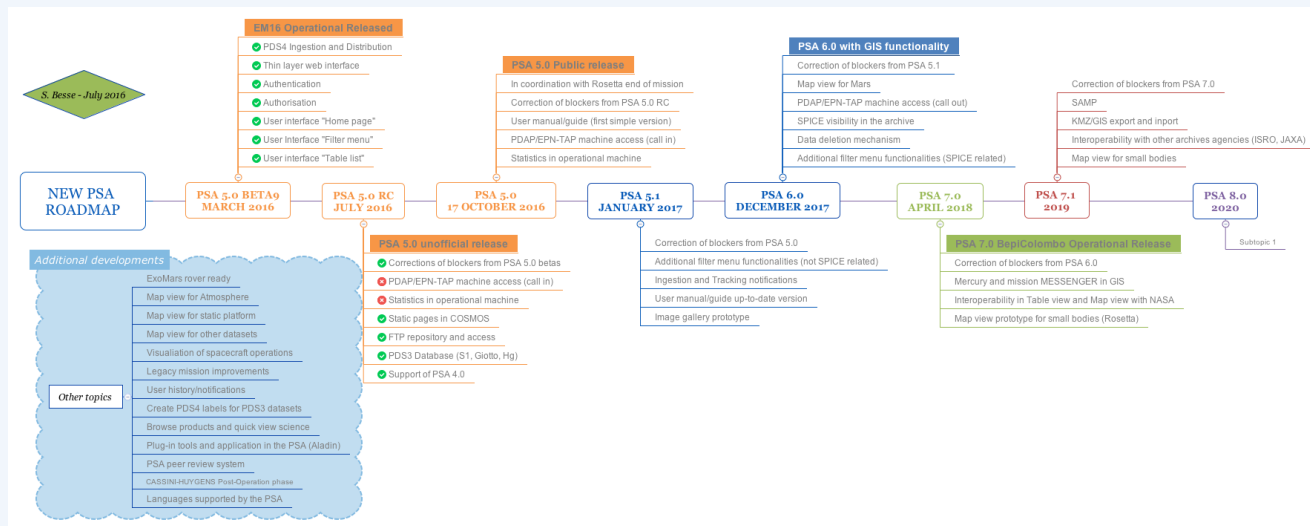
Identifier	MEX-M-HRSC-5-REFDR-MAPPROJECTED-V2.0:DATA\H0334_0001_ND3.IMG
Title	H0334_0001_ND3.IMG
Version	6.1
Start Date	2004-04-24T14:11:43Z
Stop Date	2004-04-24T14:15:48Z
Purpose	
Processing Level	3
Modification Date	2015-11-10Z
Distribution Path	0334
Target Name	MARS
Bundle Logical Identifier	MEX-M-HRSC-5-REFDR-MAPPROJECTED-V2.0

Roadmap for the next years



Roadmap has significantly shifted, but only so that you get more reliable products

1. 2016: First release, EM16 Operational archive, PDS4 ready
2. 2017: Image Gallery, GIS on Mars, Interoperability prototype
3. 2018: BepiColombo Operational archive in PDS4
4. 2019, 2020, etc.. (Juice, ExoMars RSP, PDS3 to PDS4, ...)



The upcoming new the PSA will...

- .. Be an operational archive hosting more than 8 Millions scientific products coming from 70 instruments with two different formats (PDS4, PDS3)
- .. Offer multiple functionalities to search and visualize the datasets you need to make new science discoveries
- .. Not be the last one, a busy roadmap for the next 5 years ensures significant improvement for the science usability of ESA's missions
- .. Is the work of many people that are listening for your next inputs, so don't be shy !

psa.esa.int