

Cassini and the PDS Ring-Moon Systems Node

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T-17

OPUS – **Outer Planets Unified Search**

https://tools.pds-rings.seti.org/opus

The Ring-Moon Systems Node (RMS Node) hosts the complete sets of data submitted to the PDS by the Cassini remote sensing instruments – more than one million data products from CIRS, ISS, UVIS, and VIMS combined. The RMS Node hosts OPUS – an accurate, comprehensive search tool for spacecraft remote sensing observations beyond the asteroid belt. For Cassini, OPUS currently supports ISS, UVIS, and VIMS. We produce and incorporate into OPUS detailed geometric metadata for every object in the instruments for both the Jupiter and Saturn encounters. Search results include preview images for all products returned by a search, and calibrated images for Cassini ISS.



UVIS – four tiles per observation, borders indicate detector: blue EUV, green FUV, red HSP, yellow HDAC.

ISS short wavelength filer combo ISS long wavelength filter combo

VIMS – green border: enhanced for methane. Blue the mean of two methane peaks near 1 &1.3 microns. Green maps to~2.01 microns, and red to ~2.8 microns

OPUS supports planetary systems – planets, satellites, and rings. Cassini data of ALL objects in the Jupiter and Saturn systems are supported with expanded sets of metadata, enabling powerful searches. The expanded metadata includes high resolution geometric metadata based on the best available spice kernels for every target in the field of view.

I decided to search for data obtained of Saturn's north polar hexagonal storm intended to be used for movies – preferably with observations from multiple instruments.

I could have used the enhanced geometry metadata generated at the RMS Node (e.g., latitude range, resolution, illumination geometry), but I wanted to use Cassini-specific parameters.

A selection in the left column opens a box on the right and reveals more options in the left column.

I started with Mission = Cassini and then searched for CIMS Observation IDs (Observation Name in OPUS) which contain 'npol' and 'mov', and then narrowed the search using Orbit Number.

This shows how quickly the search results are refined.

Parameter	Entry	#of Observations Return
Mission	Cassini	1,368,024
Observation Name	npolmov	4,756
Orbit Number	271	497

Click on the Browse Tab

Note that the results include ISS, UVIS, and VIMS.

On the Browse Tab

- Select the ones you want to download.
- Click on a thumbnail for a higher resolution browse view and details of the observation.

Keys to interpreting the browse products are available here: https://pds-rings.seti.org/cassini/enhanced.html

To download your selections, click on "Selections"

- The download includes a csv table of metadata.
- You can select or deselect columns for the table.
- Results are packaged in a zip file for download.

OPUS Browse Results **497** Selections **0** Detail Recent Announcements Search

Intended Target Name 🚯 <u>Nominal Targ</u>et Class 🕕 Mission 📵 Instrument Host Name 🕕 Instrument Name 🕕 Observation Time 🚯 Observation Duration 📵 Spatial Sampling 🕕 Wavelength Sampling 📵 Time Sampling 📵 Measurement Quantity 📵 Right Ascension 🕕 Declination 🕕 DS Constraints nage Constraints Navelength Constraints Surface Geometry Constraints Saturn Surface Geometry Constraints » Planetographic Latitude » Planetocentric Latitude » IAU West Longitude » Distance & Resolution » Lighting Geometry ing Geometry Constraints assini Mission Constraints



	Observation Name 🗊
	Activity Name 🗊
	Mission Phase 🕄
	Cassini Target Code 🚯
	Saturn Orbit Number (By Checkbo
	8
	Saturn Orbit Number (By Range)

ervation Name 1 Cassini 497 Galileo 0 Hubble 0 New Horizons 0 Voyager 0

OPUS is a project of the Planetary Ring-Moon Systems Node • About • Datasets • API • Blog • Questions and Comments •



OPUS Search Browse Results 497 Selections 1 Detail Recent Announcements

OPUS ID: COISS_2112-1871853732_1871864139-W1871855561_

- PDS Products
- Browse Image (full-size): jpg Browse Image (medium): jpg Browse Image (small): jpg Browse Image (thumbnail): jpg Calibrated Data: IMG LBL
- Planet Geometry Index: tab |bl Raw Data: IMG LBL fmt fmt
- Ring Geometry Index: tab |b|
- Satellite Geometry Index: tab |b|
- Target Body Inventory: tab |b|

Metadata for Current Columns

 Instrument Name: COISS • Intended Target Name: SATURN • Observation Start Time (UTC): 2017-115T22:44:02.968 • Observation Duration: 10.0 • Planet: SAT OPUS ID: COISS_2112-1871853732_1871864139-W1871855561_1

All Metadata for this Observation

Grab all metadata as json

General Constraints

• Planet: SAT Intended Target Name: SATURN Nominal Target Class: PLANET Mission: CO • Instrument Host Name: CO Instrument Name: COISS Observation Start Time (UTC): 2017-115T22:44:02.968 Observation Stop Time (UTC): 2017-115T22:44:12.968 Observation Start Time (seconds): 546475479.968 Observation Stop Time (seconds): 546475489.968 • Observation Duration: 10.0 • Spatial Sampling: 2D Wavelength Sampling: No Time Sampling: No



OPUS includes enhanced geometry for: • Cassini ISS, UVIS, VIMS

Plans for future OPUS expansion include: • Ring occultations – Cassini, Voyager, Earth

The RMS Node maintains a suite of tools, including Cassini-specific versions of:





• Voyager ISS (all six encounters)

OPUS supports, without enhanced geometry:

New Horizons MVIC

• Galileo SSI

• HST ACS, NICMOS, STIS, WFC3, WFPC2

• Full Cassini CIRS data set w/ geometry

• F-Ring mosaics

based

VIMS reflectance spectra



- Saturn Moon Tracker

- Saturn Ephemeris Generator

- Jupiter Viewer

- Jupiter Moon Tracker

- Jupiter Ephemeris Generator

Contact me to discuss OPUS, the RMS Node, or to discuss

archiving in PDS, or using PDS4.

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Also available to discuss all aspects of PDS is Emily Law from the PDS Engineering Node. Emily.law@jpl.nasa.gov 818-667-5535.