Rings Node Report

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PDS Management Council Meeting
Washington, DC
April 3, 2008

Overview

- Search engine
  - On-the-fly movies
- Metadata generation
- Data previews & thumbnails
- HST archiving & cataloging
- Voyager “value-added” activities
- Cassini “value-added” activities

Cassini CIRS

Voyager ISS

Cassini VIMS

Voyager UVS
Voyager PPS
Voyager RSS
Cassini UVIS
Cassini RSS

Cassini ISS

Heirarchical View of Data Sets

Cassini CIRS
- Spectra
- Occultations

Voyager ISS
- Derived Products

Cassini VIMS
- Cubes
- Occultations

Voyager UVS
Voyager PPS
Voyager RSS
Cassini UVIS
Cassini RSS

Cassini ISS
- Derived Products

Heirarchical View of Data Sets

Ring Data

Cassini CIRS
- Spectra
- Occultations

Voyager ISS
- Derived Products

Cassini VIMS
- Cubes
- Occultations

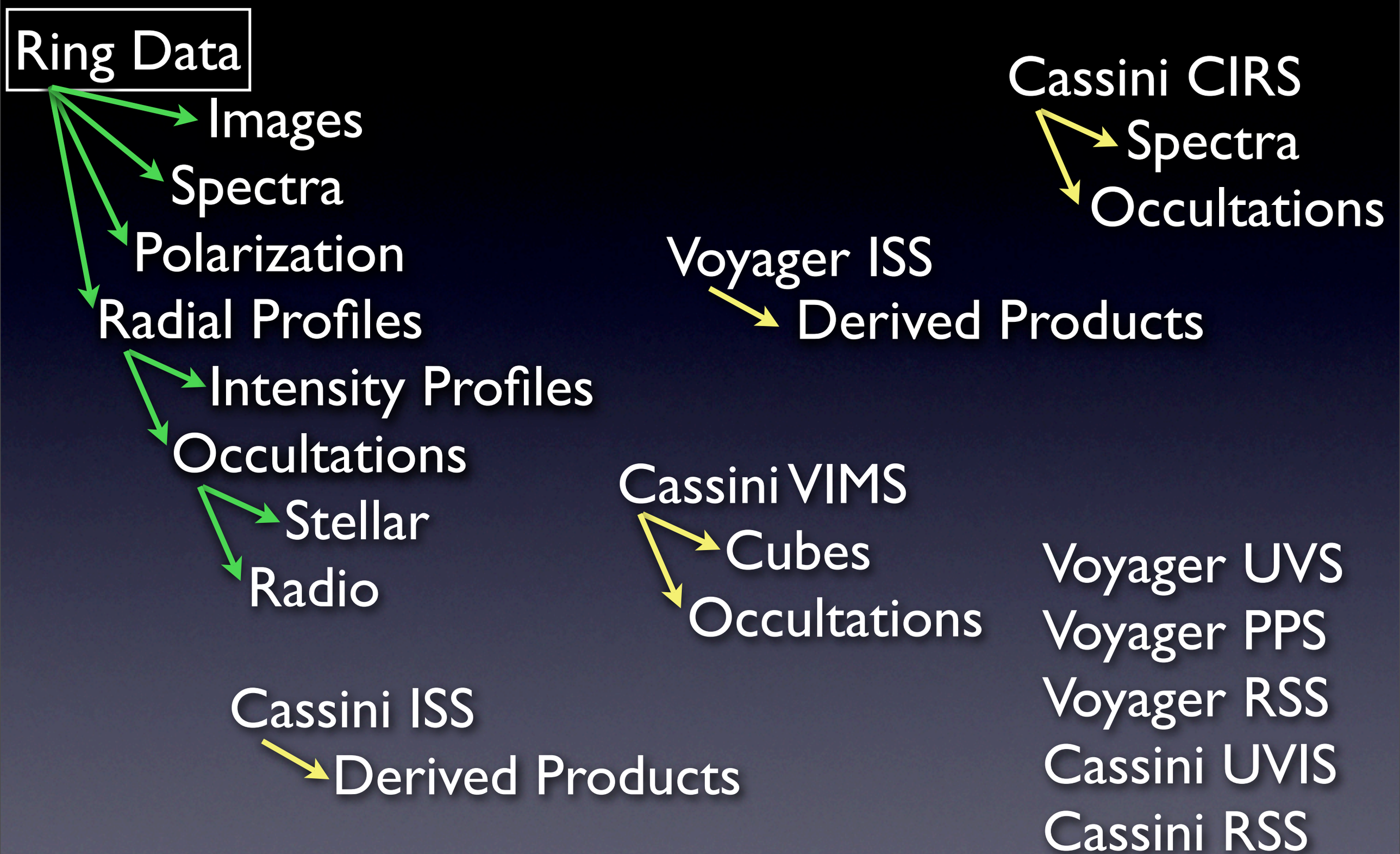
Voyager UVS
Voyager PPS
Voyager RSS
Cassini UVIS
Cassini RSS

Cassini ISS
- Derived Products

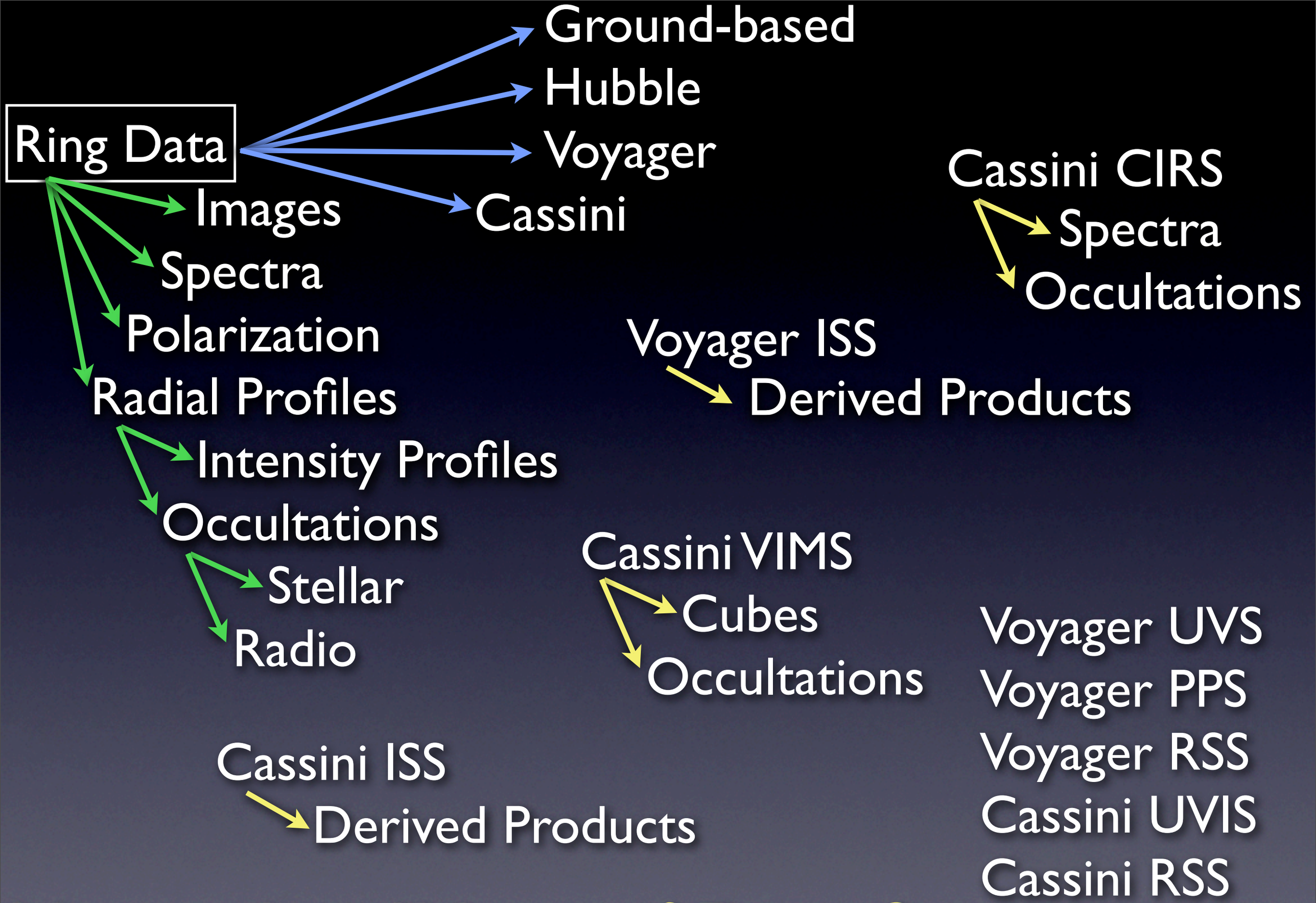
Heirarchical View of Data Sets

Heirarchical View of Data Sets

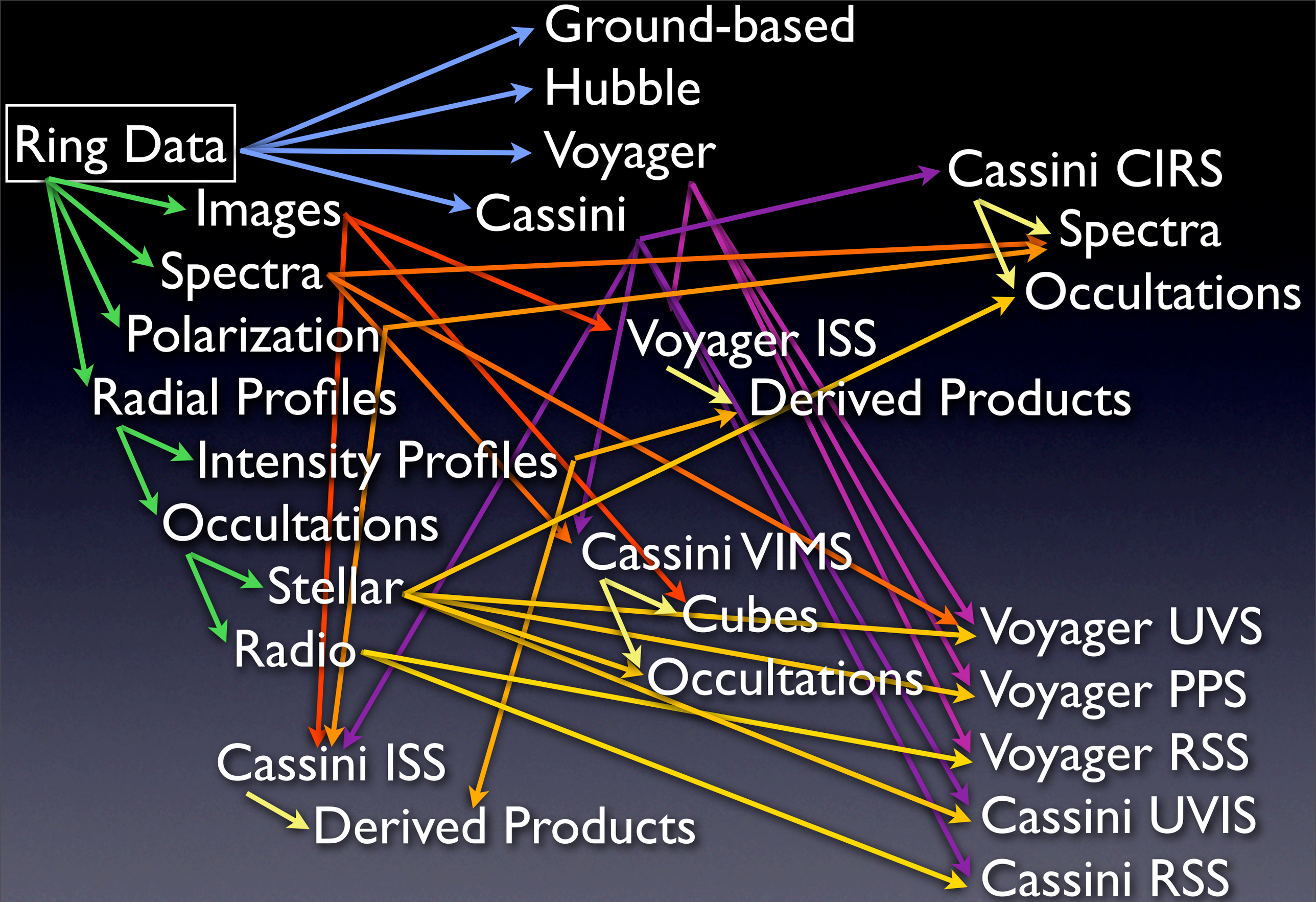
- Ring Data
  - Images
  - Spectra
  - Polarization
  - Radial Profiles
- Cassini CIRS
  - Spectra
  - Occultations
- Voyager ISS
  - Derived Products
- Cassini VIMS
  - Cubes
  - Occultations
- Cassini ISS
  - Derived Products
- Voyager UVS
- Voyager PPS
- Voyager RSS
- Cassini UVIS
- Cassini RSS



Heirarchical View of Data Sets



Heirarchical View of Data Sets



Heirarchical View of Data Sets

NASA PDS Rings Node Data Search Tool

http://pds-rings.seti.org/search/index.php?start_over=yes

NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 83,471 | View Results

save this query

- [x] General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- Cassini Mission Constraints
- Cassini ISS Constraints

General Constraints

- [x] Planet
  - [ ] Jupiter
  - [x] **Saturn**
  - [ ] Uranus
  - [ ] Neptune
- Nominal Target Name
- Nominal Target Class
- Mission
- [x] Instrument Host Name
  - [x] **Cassini Orbiter**
  - [ ] Voyager 1
  - [ ] Voyager 2
  - [ ] Galileo
  - [ ] Hubble Space Telescope
- Instrument Name
  - [ ] Cassini CIRS
  - [ ] Cassini ISS
  - [ ] Voyager ISS
  - [ ] Cassini UVIS
  - [ ] Hubble ACS
  - [ ] Hubble WFPC2
  - [ ] Voyager IRIS
- Observation Time
- Target Intercept Time
- Observation Class
- Measurement Quantity
- [x] Data Type
  - [x] **Image**
  - [ ] Line
  - [ ] Point
- Ring Observation ID
- Note
- Right Ascension
- Declination

NASA PDS Rings Node Data Search Tool

http://pds-rings.seti.org/search/index.php?start_over=yes

NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 83,471 | View Results

save this query

- General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- Cassini Mission Constraints
- Cassini ISS Constraints

General Constraints

User Selects Saturn, Cassini, Images

- [x] Planet
  - [ ] Jupiter
  - [x] Saturn
  - [ ] Uranus
  - [ ] Neptune
- Nominal Target Name
- Nominal Target Class
- Mission
- [x] Instrument Host Name
  - [x] Cassini Orbiter
  - [ ] Voyager 1
  - [ ] Voyager 2
  - [ ] Galileo
  - [ ] Hubble Space Telescope
- Instrument Name
  - [ ] Cassini CIRS
  - [ ] Cassini ISS
  - [ ] Voyager ISS
  - [ ] Cassini UVIS
  - [ ] Hubble ACS
  - [ ] Hubble WFPC2
  - [ ] Voyager IRIS
- Observation Time
- Target Intercept Time
- Observation Class
- Measurement Quantity
- [x] Data Type
  - [x] Image
  - [ ] Line
  - [ ] Point
- Ring Observation ID
- Note
- Right Ascension
- Declination

NASA PDS Rings Node Data Search Tool

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NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 83,471 | View Results

save this query

Current result count appears

General Constraints

- General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- Cassini Mission Constraints
- Cassini ISS Constraints

Planet

Jupiter | **Saturn** | Uranus | Neptune

Nominal Target Name

Nominal Target Class

Mission

Instrument Host Name

Cassini Orbiter | Voyager 1 | Voyager 2 | Galileo | Hubble Space Telescope

Instrument Name

Cassini CIRS | Cassini ISS | Voyager ISS | Cassini UVIS | Hubble ACS | Hubble WFPC2 | Voyager IRIS

Newly relevant options appear

Observation Time

Target Intercept Time

Observation Class

Measurement Quantity

Irrelevant options are grayed out elsewhere

Data Type

Image | Line | Point

Ring Observation ID

Note

Right Ascension

Declination

NASA PDS Rings Node Data Search Tool

http://pds-rings.seti.org/search/index.php?start_over=yes

NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | View Results

save this query

- General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- **Cassini Mission Constraints**
- Cassini ISS Constraints

Cassini Mission Constraints

Observation Name

contains | FMOV

- Saturn Orbit Number
- Spacecraft Clock Count
- Is Prime
- Primary Instrument
- Earth Received Time

User enters a Cassini-specific constraint

NASA PDS Rings Node Data Search Tool

http://pds-rings.seti.org/search/index.php?start_over=yes

NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | View Results

save this query

Result count is updated

- General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- **Cassini Mission Constraints**
- Cassini ISS Constraints

Cassini Mission Constraints

Observation Name

contains | FMOV

- Saturn Orbit Number
- Spacecraft Clock Count
- Is Prime
- Primary Instrument
- Earth Received Time

NASA PDS Rings Node Data Search Tool

http://pds-rings.seti.org/search/index.php?start_over=yes

NASA PDS Rings Node... | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | View Results

save this query

User is ready to view results

- General Constraints
- Ring Geometry Constraints
- Wavelength Constraints
- Image Constraints
- **Cassini Mission Constraints**
- Cassini ISS Constraints

Cassini Mission Constraints

Observation Name

contains | FMOV

- Saturn Orbit Number
- Spacecraft Clock Count
- Is Prime
- Primary Instrument
- Earth Received Time

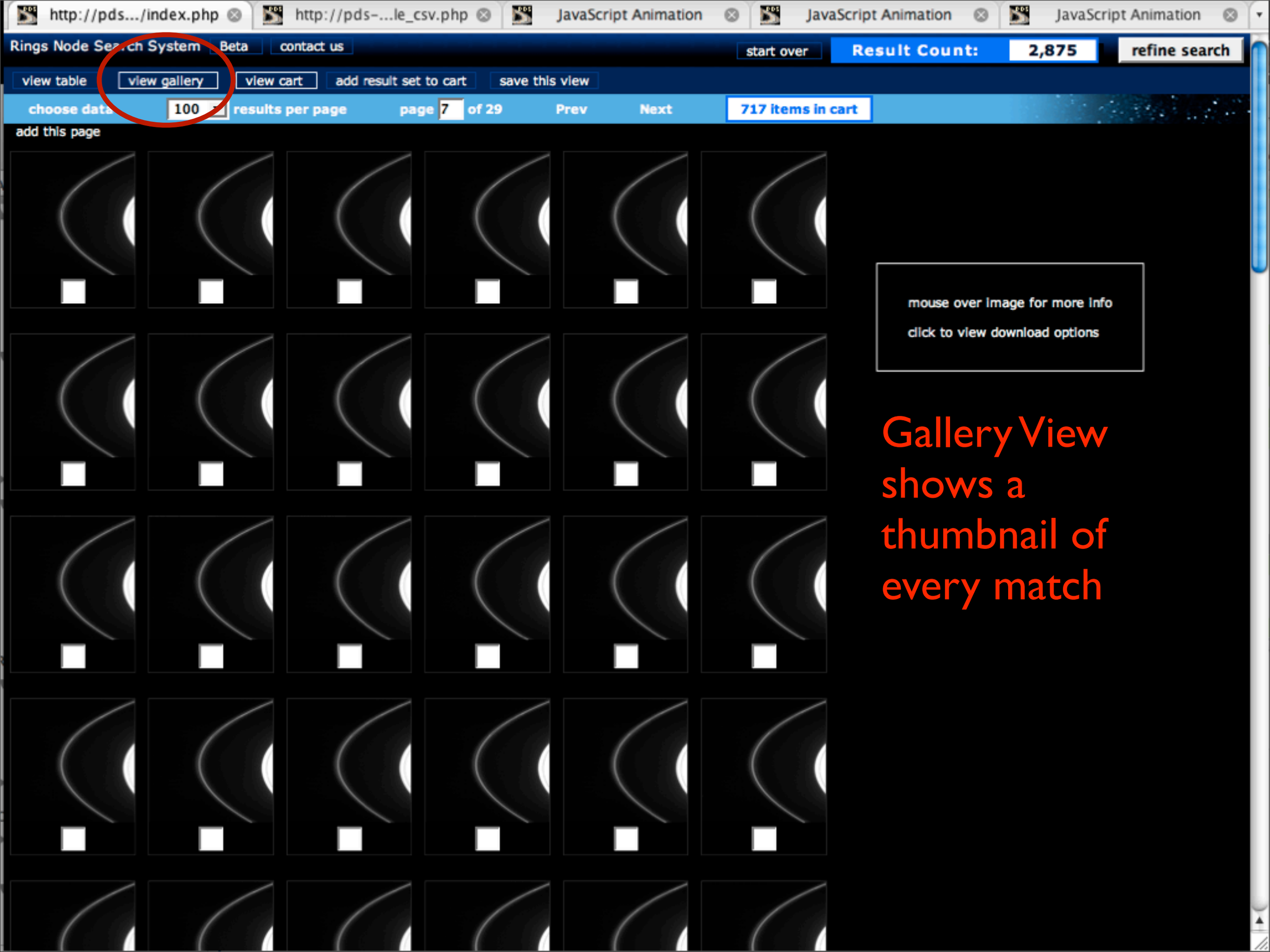
Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | refine search

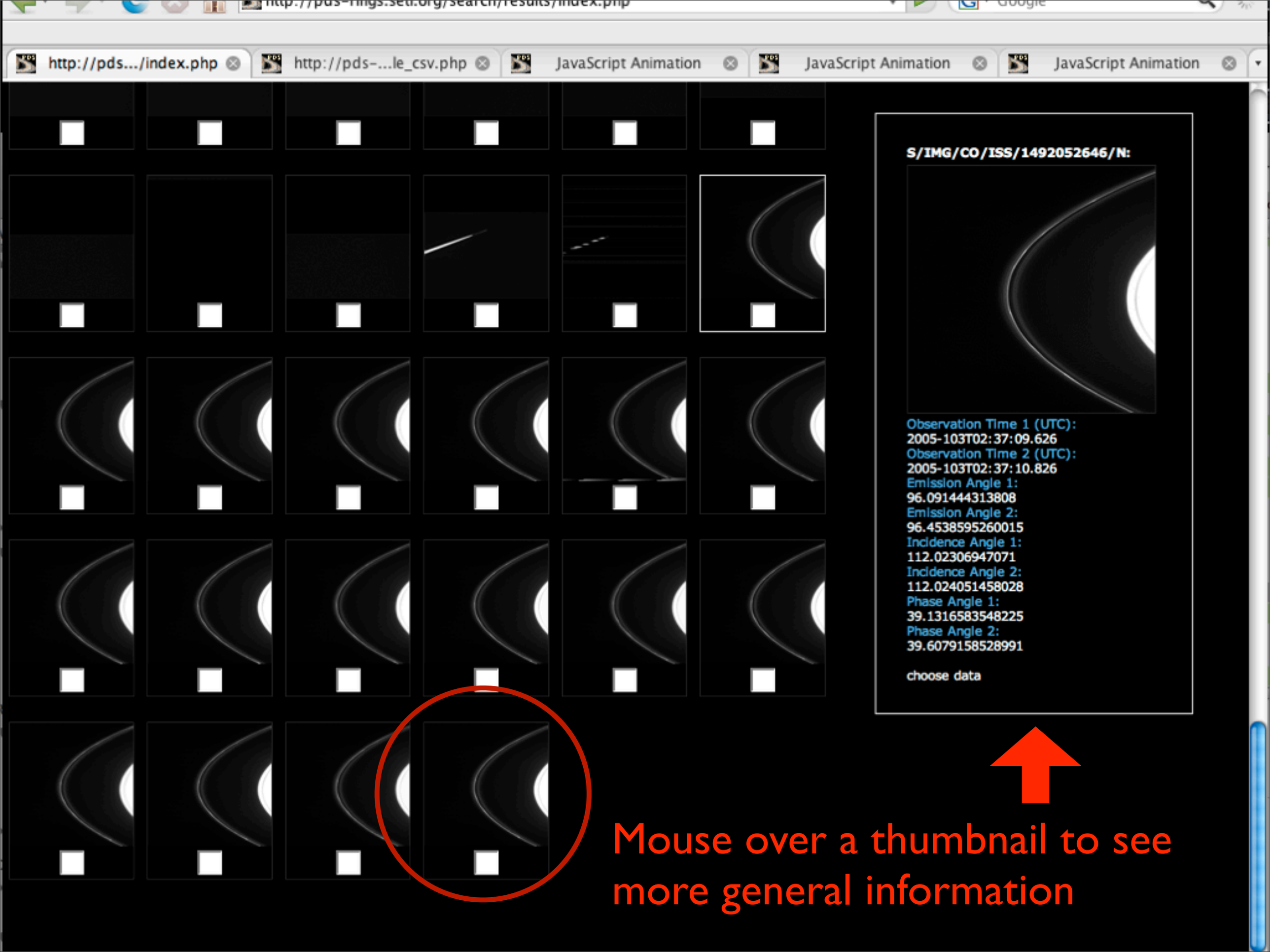
view table | view gallery | view cart | add result set to cart | save this view

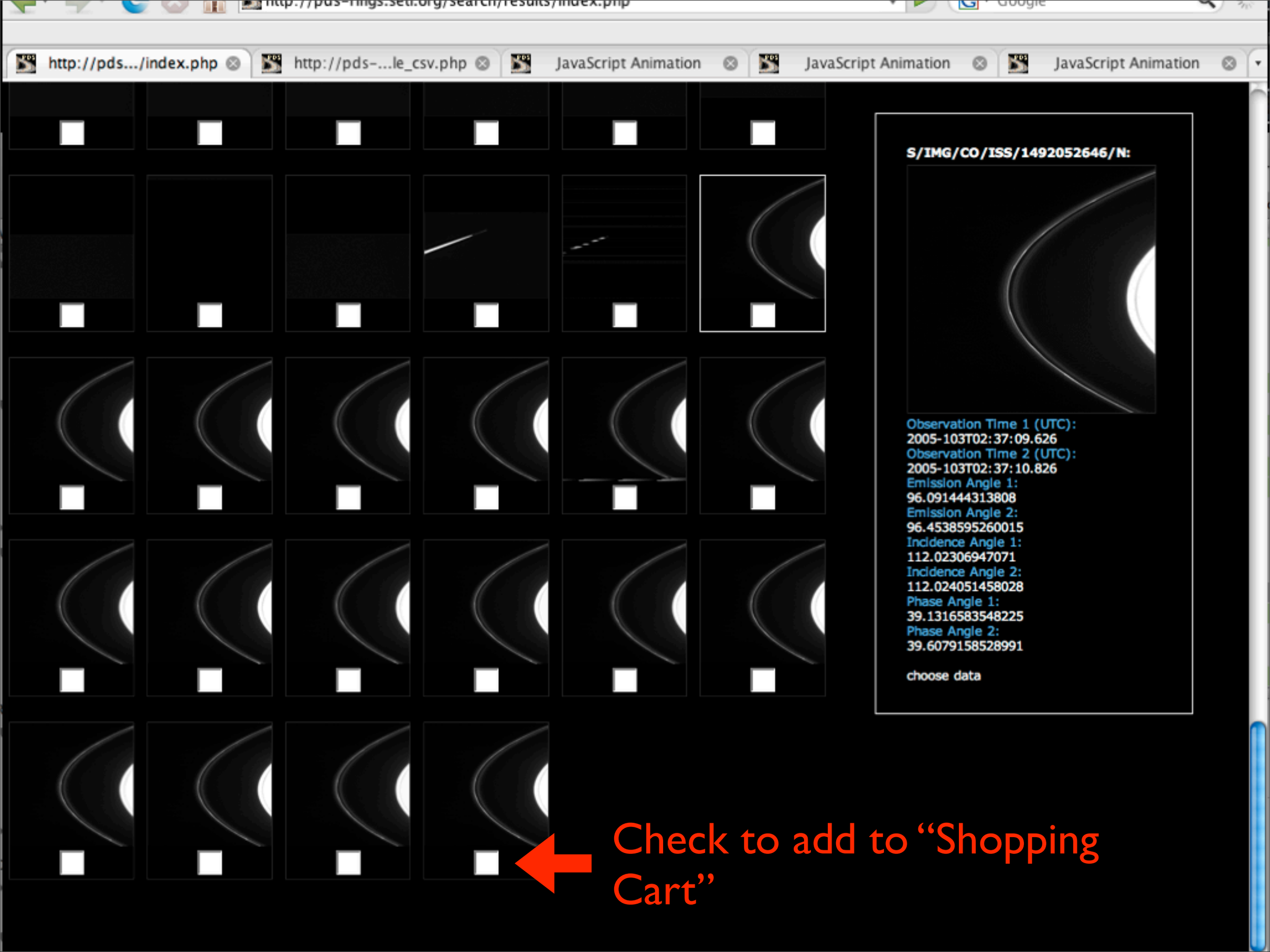
choose columns | 100 results per page | page 1 of 29 | Prev | Next

Table View is fully customizable

add this page	Ring Observation ID	Observation Time 1 (UTC)	Observation Time 2 (UTC)	Emission Angle 1	Emission Angle 2	Incidence Angle 1	Incidence Angle 2	Phase Angle 1
	S/IMG/CO/ISS/1486895772/N	2005-043T10:09:48.923	2005-043T10:09:49.923	92.094	92.446	112.600	112.604	52.091
	S/IMG/CO/ISS/1486895892/N	2005-043T10:11:48.922	2005-043T10:11:49.922	92.093	92.445	112.600	112.604	52.085
	S/IMG/CO/ISS/1486896012/N	2005-043T10:13:48.921	2005-043T10:13:49.921	92.093	92.445	112.600	112.604	52.082
	S/IMG/CO/ISS/1486896132/N	2005-043T10:15:48.920	2005-043T10:15:49.920	92.093	92.445	112.600	112.604	52.075
	S/IMG/CO/ISS/1486896252/N	2005-043T10:17:48.920	2005-043T10:17:49.920	92.093	92.445	112.600	112.604	52.069
	S/IMG/CO/ISS/1486896372/N	2005-043T10:19:48.919	2005-043T10:19:49.919	92.092	92.444	112.600	112.604	52.066
	S/IMG/CO/ISS/1486896492/N	2005-043T10:21:48.918	2005-043T10:21:49.918	92.092	92.444	112.600	112.604	52.060
	S/IMG/CO/ISS/1486896612/N	2005-043T10:23:48.917	2005-043T10:23:49.917	92.092	92.444	112.600	112.604	52.054
	S/IMG/CO/ISS/1486896732/N	2005-043T10:25:48.917	2005-043T10:25:49.917	92.091	92.443	112.600	112.604	52.051
	S/IMG/CO/ISS/1486896852/N	2005-043T10:27:48.916	2005-043T10:27:49.916	92.091	92.443	112.600	112.604	52.045
	S/IMG/CO/ISS/1486896972/N	2005-043T10:29:48.915	2005-043T10:29:49.915	92.088	92.440	112.600	112.604	52.040
	S/IMG/CO/ISS/1486897092/N	2005-043T10:31:48.914	2005-043T10:31:49.914	92.087	92.439	112.600	112.604	52.037
	S/IMG/CO/ISS/1486897212/N	2005-043T10:33:48.913	2005-043T10:33:49.913	92.087	92.439	112.600	112.604	52.031
	S/IMG/CO/ISS/1486897332/N	2005-043T10:35:48.913	2005-043T10:35:49.913	92.087	92.439	112.600	112.604	52.025
	S/IMG/CO/ISS/1486897452/N	2005-043T10:37:48.912	2005-043T10:37:49.912	92.087	92.439	112.600	112.604	52.019
	S/IMG/CO/ISS/1486897572/N	2005-043T10:39:48.911	2005-043T10:39:49.911	92.087	92.439	112.600	112.604	52.016
	S/IMG/CO/ISS/1486897692/N	2005-043T10:41:48.910	2005-043T10:41:49.910	92.086	92.438	112.600	112.604	52.010
	S/IMG/CO/ISS/1486897812/N	2005-043T10:43:48.910	2005-043T10:43:49.910	92.086	92.438	112.600	112.604	52.003
	S/IMG/CO/ISS/1486897932/N	2005-043T10:45:48.909	2005-043T10:45:49.909	92.086	92.438	112.600	112.604	52.000
	S/IMG/CO/ISS/1486898052/N	2005-043T10:47:48.908	2005-043T10:47:49.908	92.085	92.437	112.600	112.604	51.994
	S/IMG/CO/ISS/1486898172/N	2005-043T10:49:48.907	2005-043T10:49:49.907	92.085	92.437	112.600	112.604	51.988
	S/IMG/CO/ISS/1486898292/N	2005-043T10:51:48.906	2005-043T10:51:49.906	92.085	92.437	112.600	112.604	51.985
	S/IMG/CO/ISS/1486898412/N	2005-043T10:53:48.906	2005-043T10:53:49.906	92.082	92.434	112.600	112.604	51.980
	S/IMG/CO/ISS/1486898532/N	2005-043T10:55:48.905	2005-043T10:55:49.905	92.081	92.433	112.600	112.604	51.975
	S/IMG/CO/ISS/1486898652/N	2005-043T10:57:48.904	2005-043T10:57:49.904	92.081	92.433	112.600	112.604	51.971


http://pds.../index.php
http://pds-...le_csv.php
JavaScript Animation
JavaScript Animation
JavaScript Animation
Rings Node Search System
Beta
contact us
start over
Result Count:
2,875
refine search
view table
view gallery
view cart
add result set to cart
save this view
choose data
100
results per page
page
7
of 29
Prev
Next
717 items in cart
add this page
mouse over image for more info
click to view download options
Gallery View shows a thumbnail of every match


http://pds-rings.seti.org/search/results/index.php
http://pds.../index.php
http://pds-...le_csv.php
JavaScript Animation
JavaScript Animation
JavaScript Animation
S/IMG/CO/ISS/1492052646/N:
Observation Time 1 (UTC):
2005-103T02:37:09.626
Observation Time 2 (UTC):
2005-103T02:37:10.826
Emission Angle 1:
96.091444313808
Emission Angle 2:
96.4538595260015
Incidence Angle 1:
112.02306947071
Incidence Angle 2:
112.024051458028
Phase Angle 1:
39.1316583548225
Phase Angle 2:
39.6079158528991
choose data
Mouse over a thumbnail to see more general information


http://pds-rings.seti.org/search/results/index.php
http://pds.../index.php
http://pds-...le_csv.php
JavaScript Animation
JavaScript Animation
JavaScript Animation
S/IMG/CO/ISS/1492052646/N:
Observation Time 1 (UTC):
2005-103T02:37:09.626
Observation Time 2 (UTC):
2005-103T02:37:10.826
Emission Angle 1:
96.091444313808
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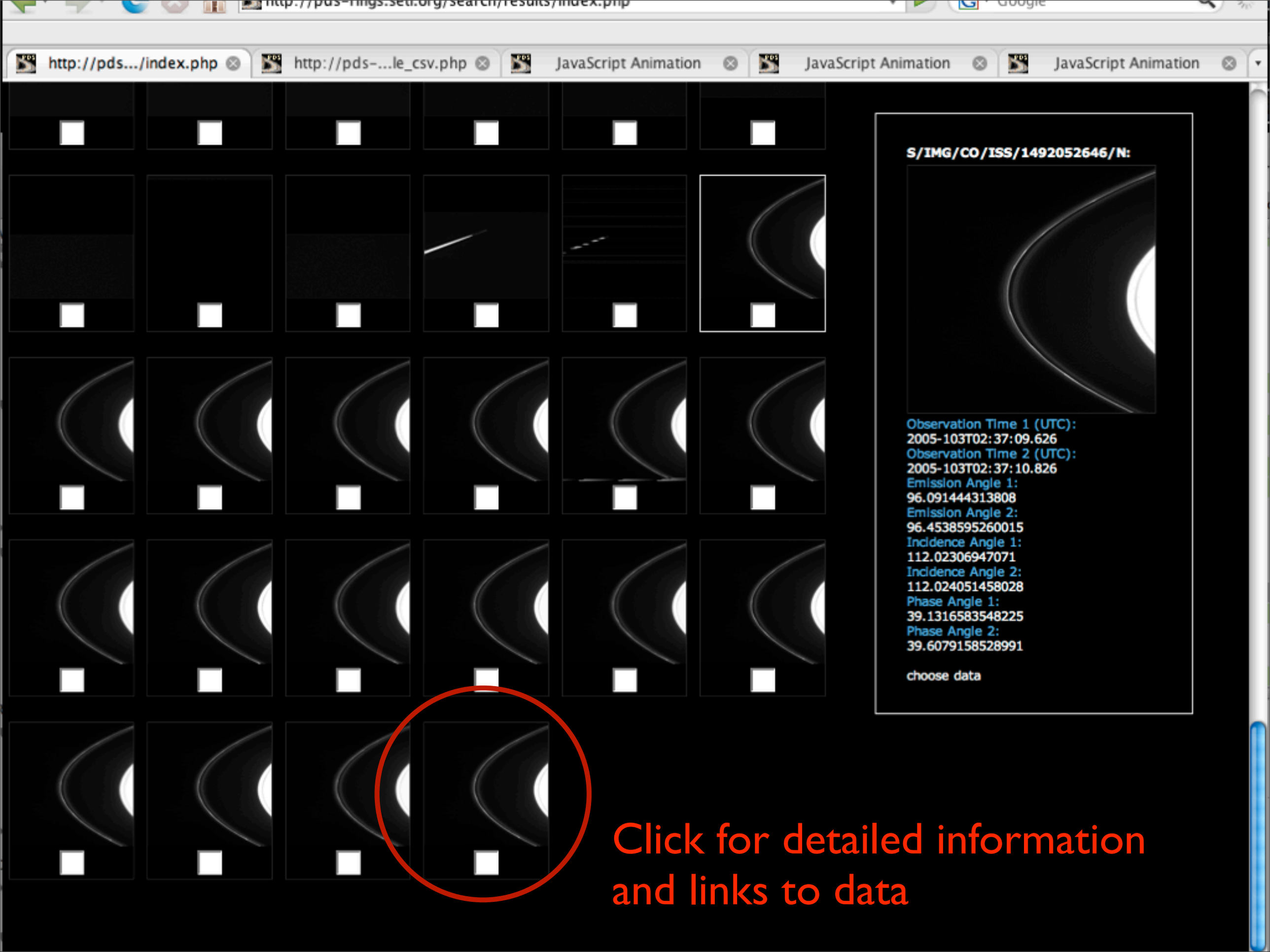
112.02306947071
Incidence Angle 2:
112.024051458028
Phase Angle 1:
39.1316583548225
Phase Angle 2:
39.6079158528991
choose data
Check to add to "Shopping Cart"


http://pds-rings.seti.org/search/results/index.php
http://pds.../index.php
http://pds-...le_csv.php
JavaScript Animation
JavaScript Animation
JavaScript Animation
S/IMG/CO/ISS/1492052646/N:
Observation Time 1 (UTC):
2005-103T02:37:09.626
Observation Time 2 (UTC):
2005-103T02:37:10.826
Emission Angle 1:
96.091444313808
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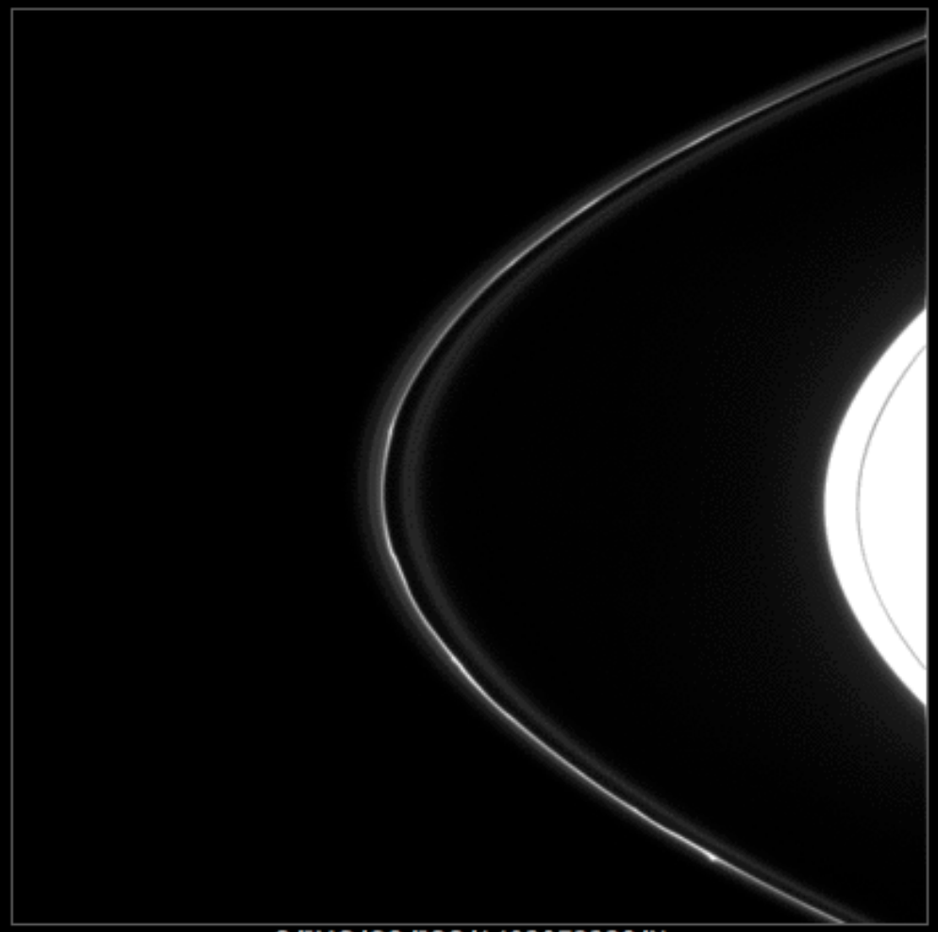
112.02306947071
Incidence Angle 2:
112.024051458028
Phase Angle 1:
39.1316583548225
Phase Angle 2:
39.6079158528991
choose data
Click for detailed information
and links to data



S/IMG/CO/ISS/1492053238/N

add to cart:

Previous Page Next Page

Products

1 Product Found:

FILE_SPECIFICATION_NAME:
DATA/1491988345_1492054459/N1492053238_1: LBL IMG FMT FMT
VOLUME_ID: COISS_2011
PRODUCT_TYPE: RAW_IMAGE
LABEL_TYPE: DETACHED
OBJECT_TYPE: IMG
FILE_FORMAT_TYPE: VICAR
INTERCHANGE_FORMAT: BINARY
note: LABEL/TLMTAB.FMT,LABEL/PREFIX2.FMT

Mozilla Firefox

http://pds-rings.seti.org/search/results/index.php

http://pds.../index.php | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | refine search

view table | view gallery | view cart | add result set to cart

You have 717 observations in your cart

Total products: 717 Total files: 2868 Total size: > 500M bytes

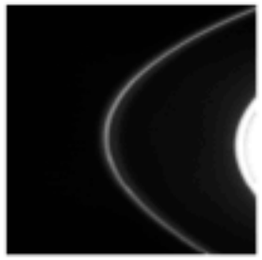
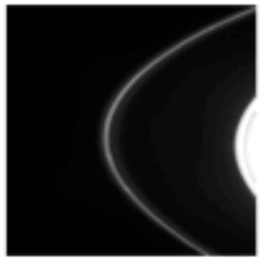
get CSV | Order CDs

Cart View shows every product selected. A zip file can be downloaded.

Observations appear below in the order they were added.
You can also view the thumbnails in your cart as a movie.
Click here to make movie

Empty Cart

100 results per page | page 1 of 8 | Prev | Next | 717 items in cart

remove this page	thunbmail	Ring Observation ID	Products	Observation Time 1 (UTC)	Observation Time 2 (UTC)	Emission Angle 1	Emission Angle 2	Incidence Angle
☑		S/IMG/CO/ISS/1492071775/N	1 of 1	2005-103T07:55:58.503	2005-103T07:55:59.703	96.279	96.650	112.021
☑		S/IMG/CO/ISS/1492071812/N	1 of 1	2005-103T07:56:35.503	2005-103T07:56:36.703	96.281	96.652	112.021

Mozilla Firefox

http://pds-rings.seti.org/search/results/index.php

http://pds.../index.php | http://pds-...le_csv.php | JavaScript Animation | JavaScript Animation | JavaScript Animation

Rings Node Search System | Beta | contact us | start over | Result Count: 2,875 | refine search

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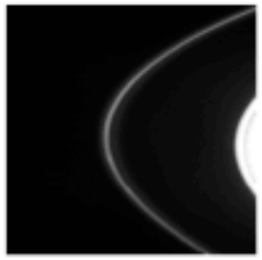
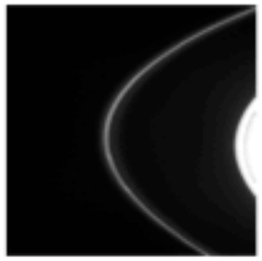
Click here to make movie

Empty Cart

Movie option is a handy way to preview your selection!

100 results per page | page 1 of 8 | Prev | Next | 717 items in cart

remove this page	thunbmail	Ring Observation ID	Products	Observation Time 1 (UTC)	Observation Time 2 (UTC)	Emission Angle 1	Emission Angle 2	Incidence Angle
☑		S/IMG/CO/ISS/1492071775/N	1 of 1	2005-103T07:55:58.503	2005-103T07:55:59.703	96.279	96.650	112.021
☑		S/IMG/CO/ISS/1492071812/N	1 of 1	2005-103T07:56:35.503	2005-103T07:56:36.703	96.281	96.652	112.021

JavaScript Animation

http://pds-rings.seti.org/search/results/animate/imain.php

http://p...dex.php | http://p..._csv.php | JavaScript Anima... | JavaScript Anima... | JavaScript Anima... | JavaScript Anima...

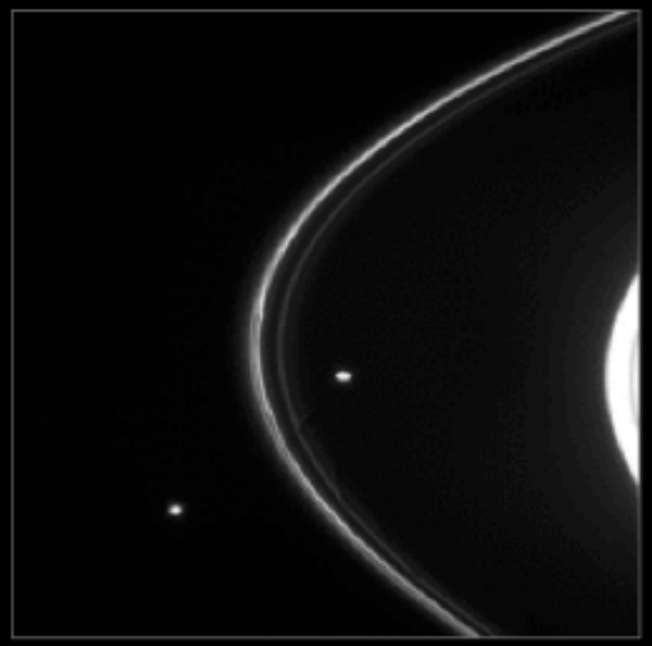
frame speed: 20 frames/sec

frame: 387

stop

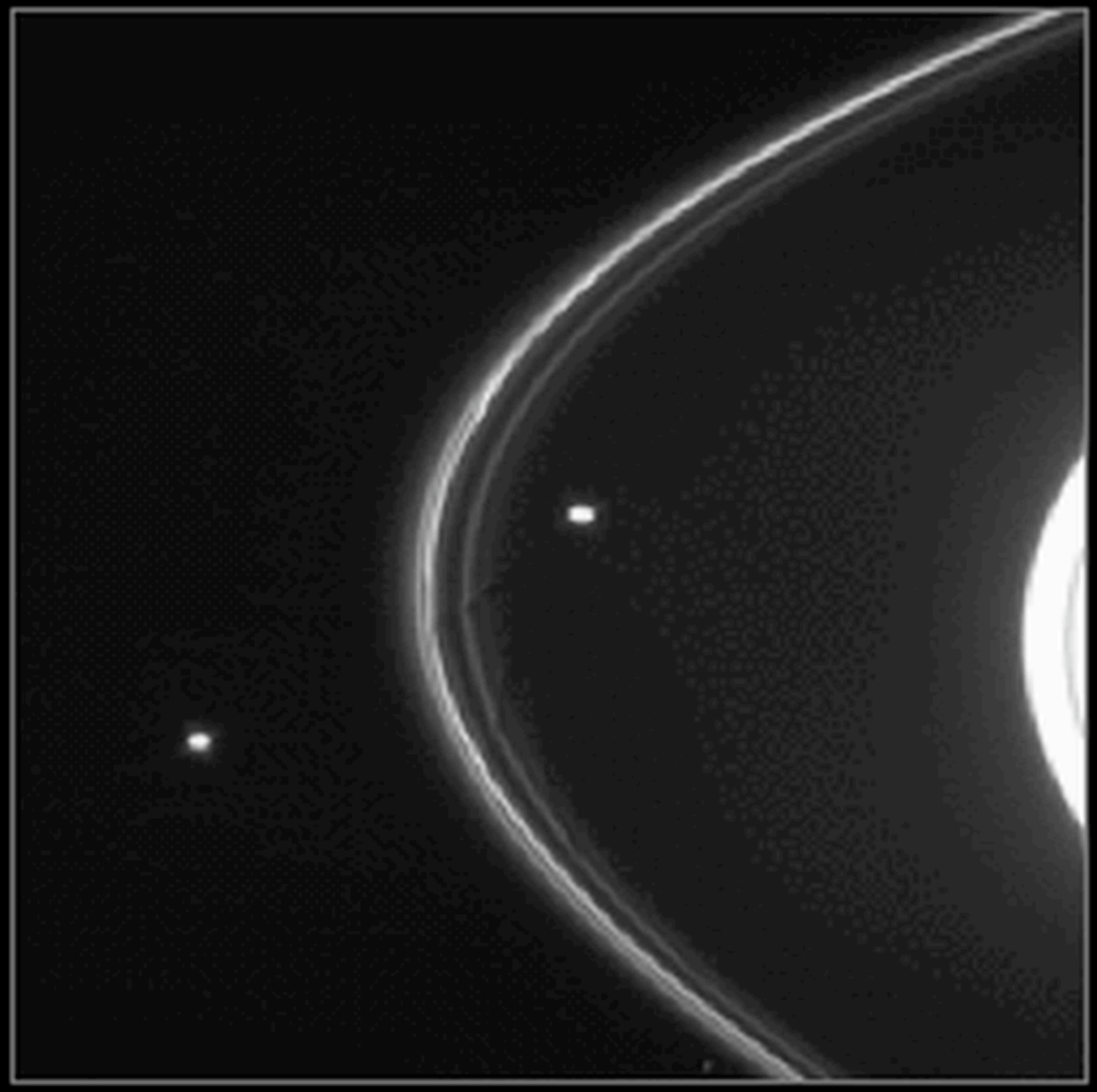
reload

close



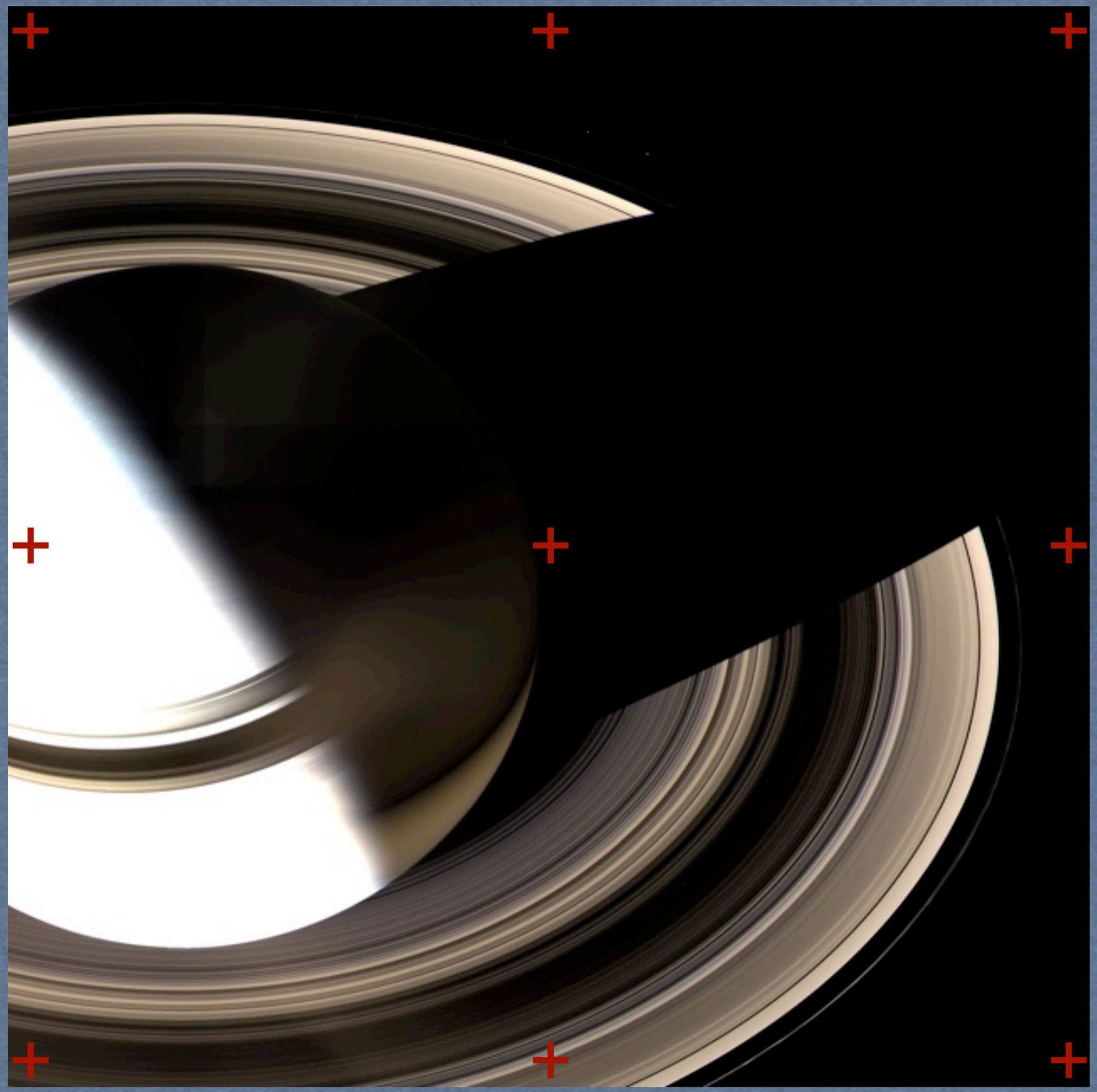
S/IMG/CO/ISS/1492086131/N

view info page



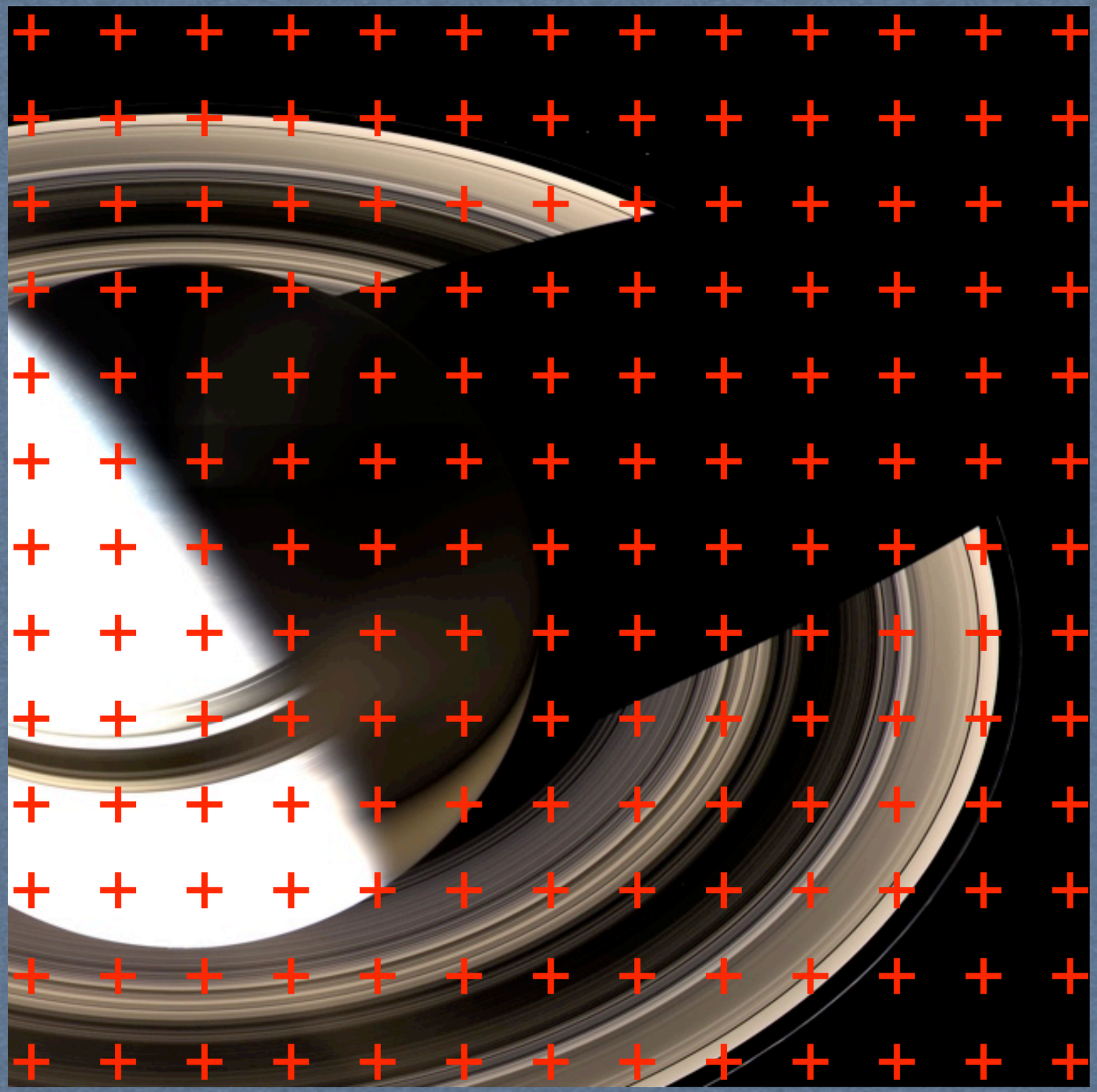
S/IMG/CO/ISS/1492086538/N

Internally-Generated Metadata



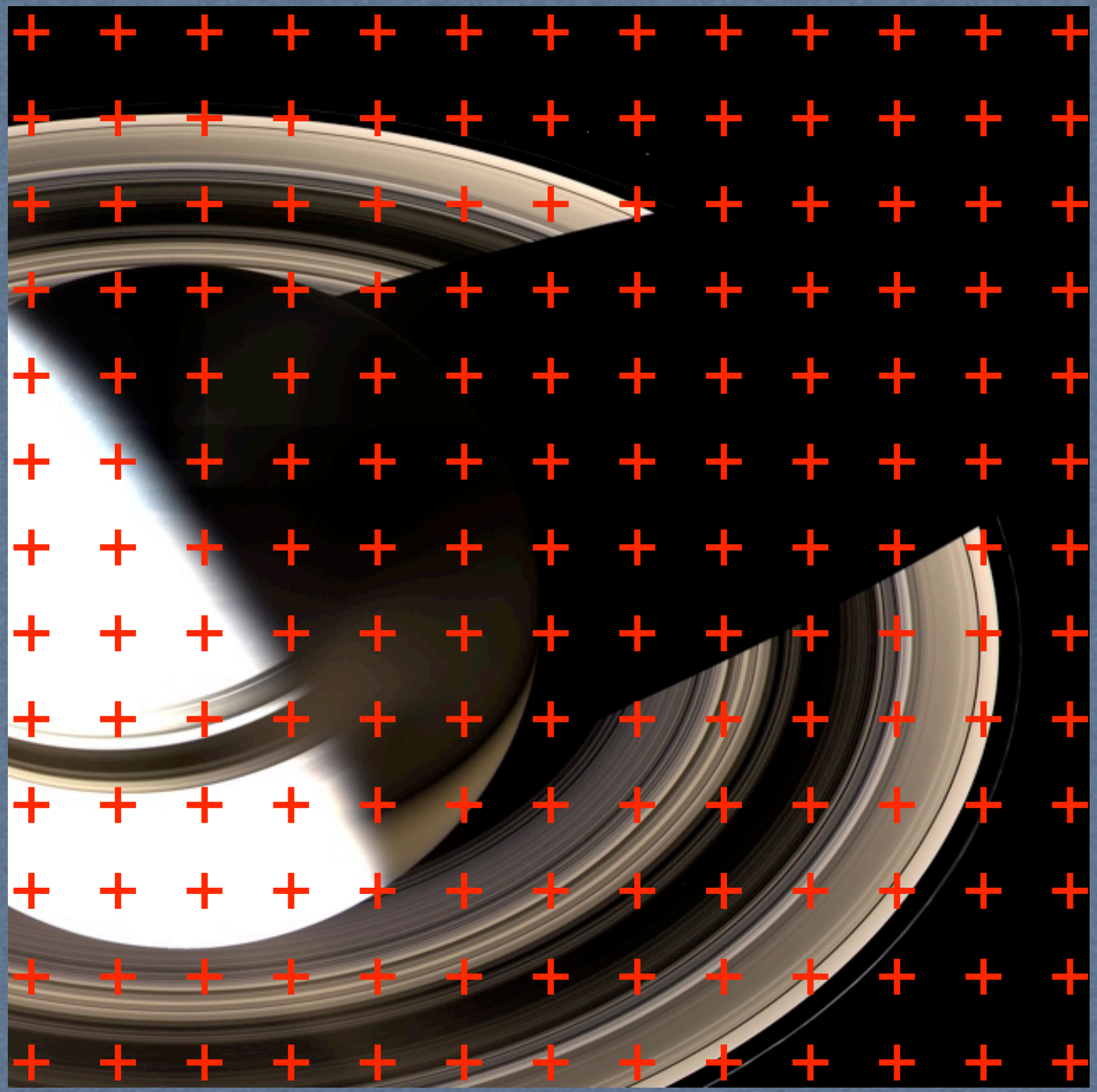
- Center and corner points are not representative of the field of view.

Internally-Generated Metadata



- Center and corner points are not representative of the field of view.
- Much finer spatial sampling is required to represent a data product.

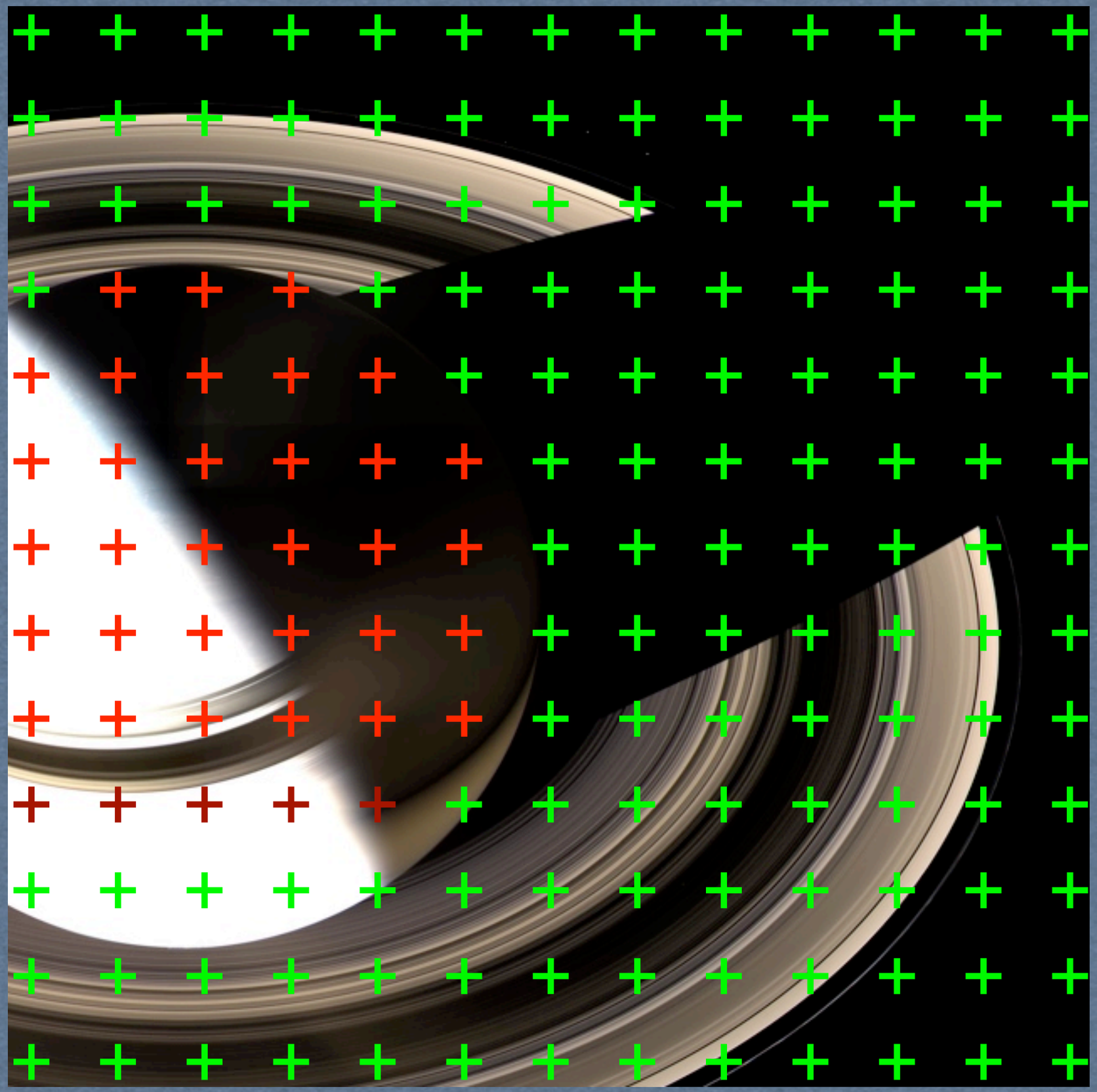
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?

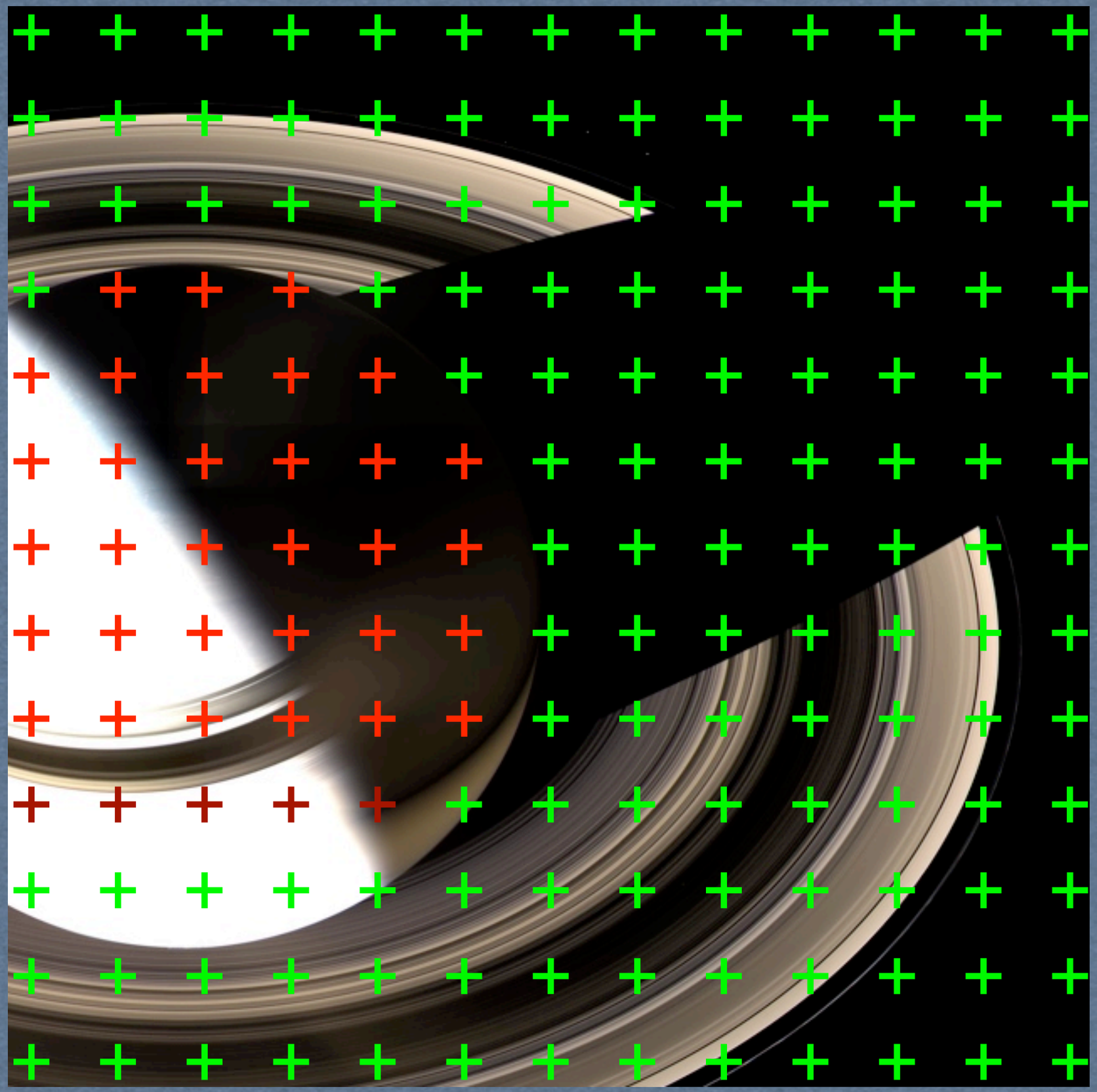
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?

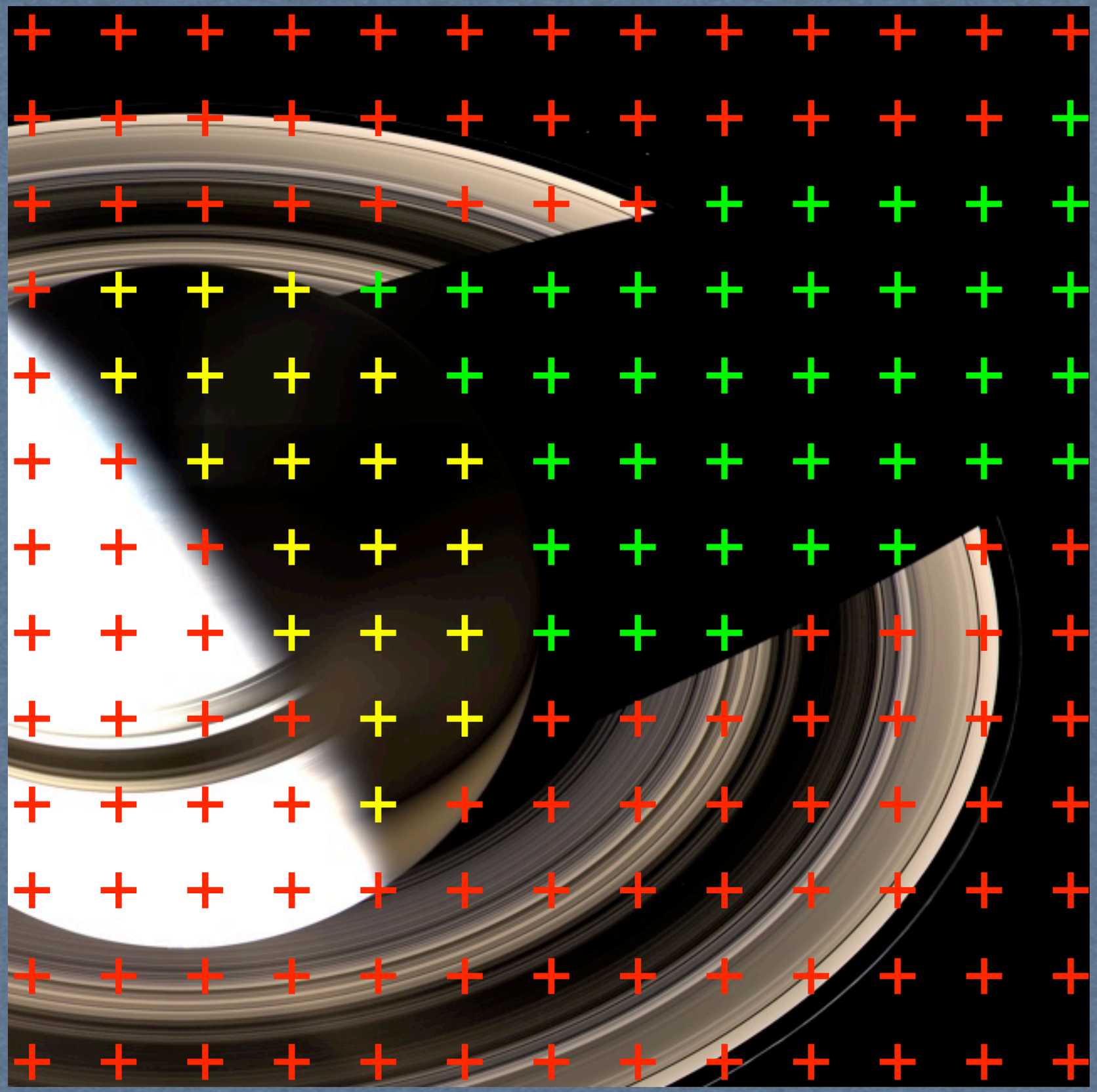
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?

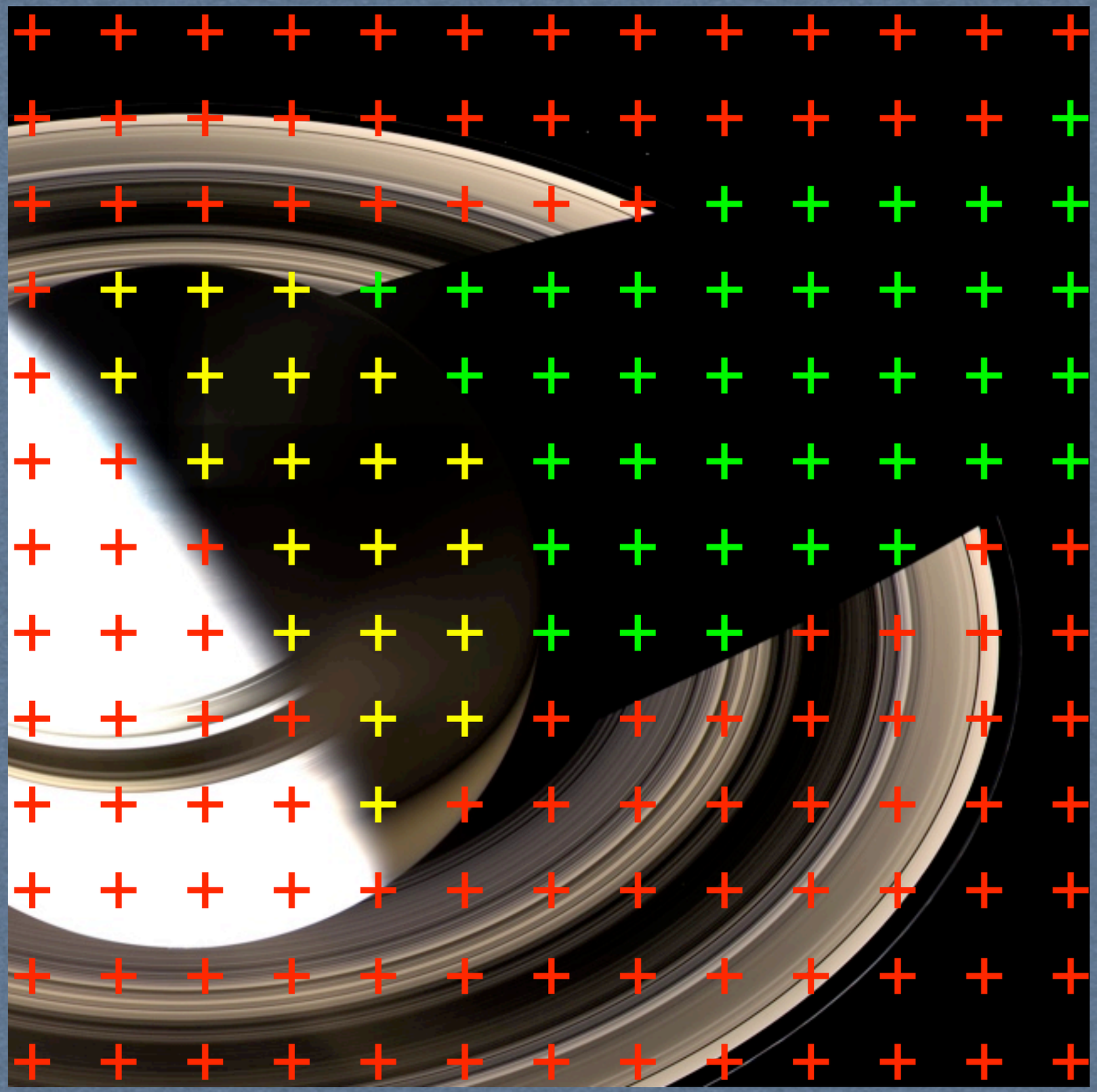
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?

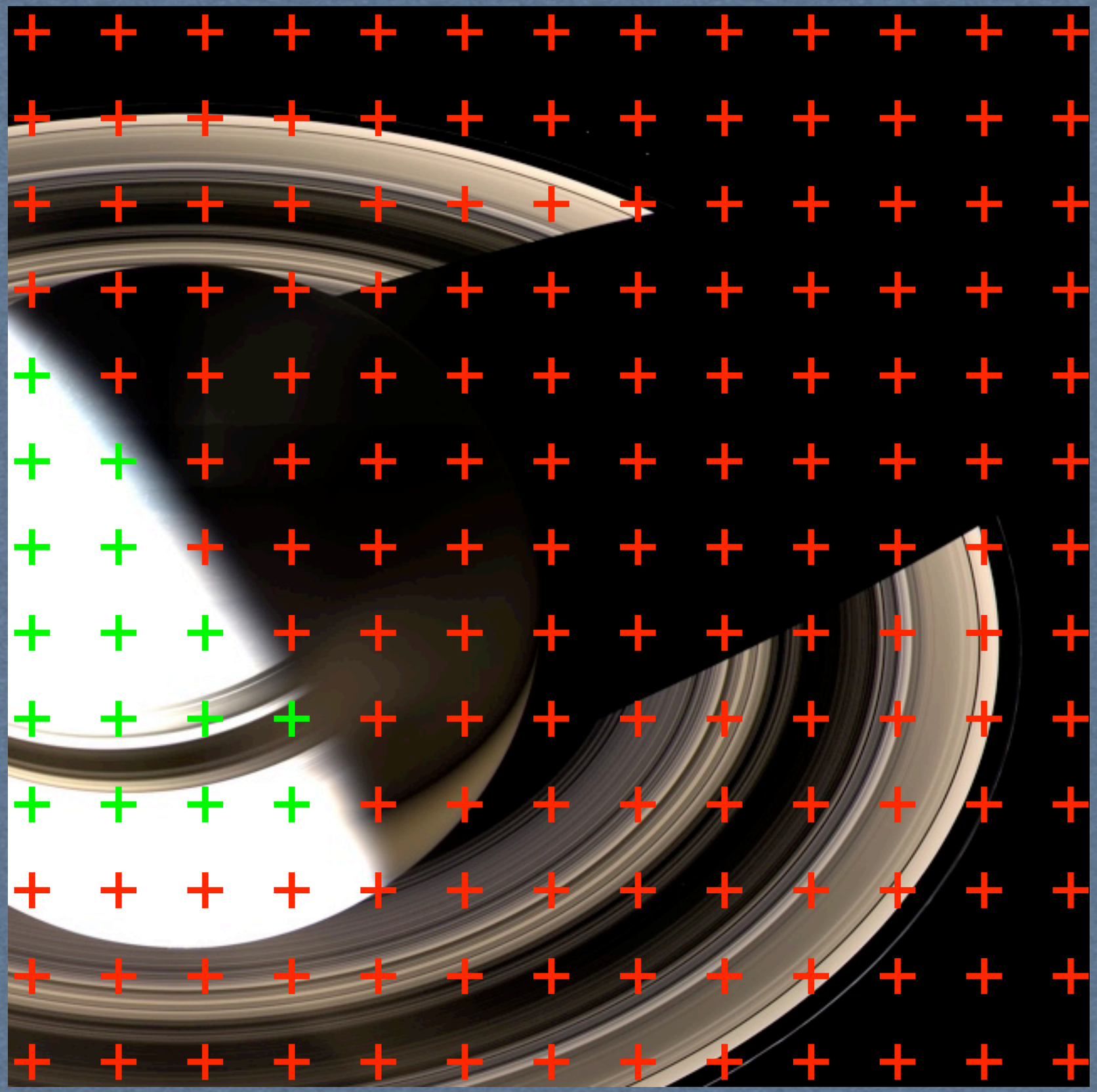
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?

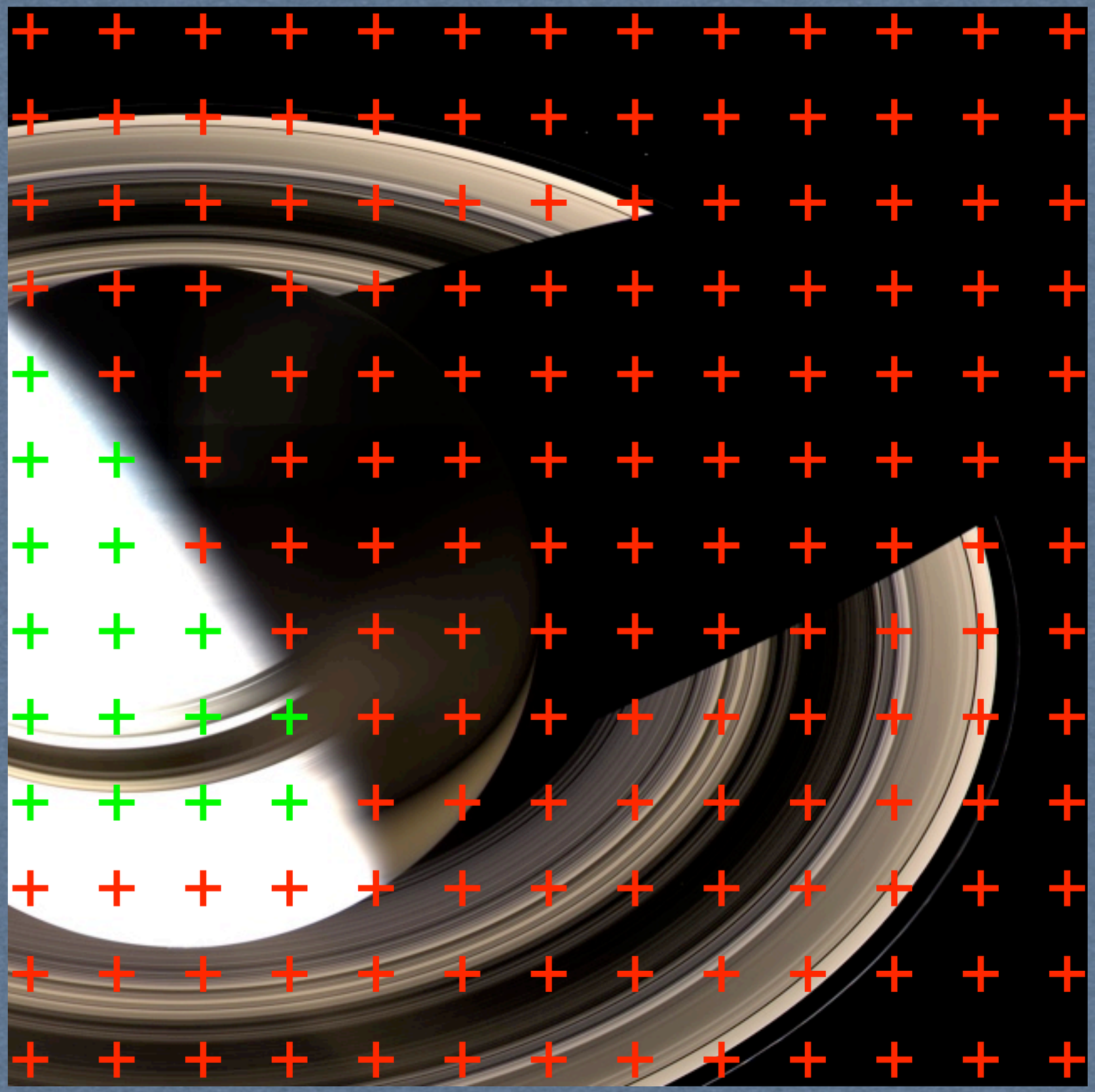
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?

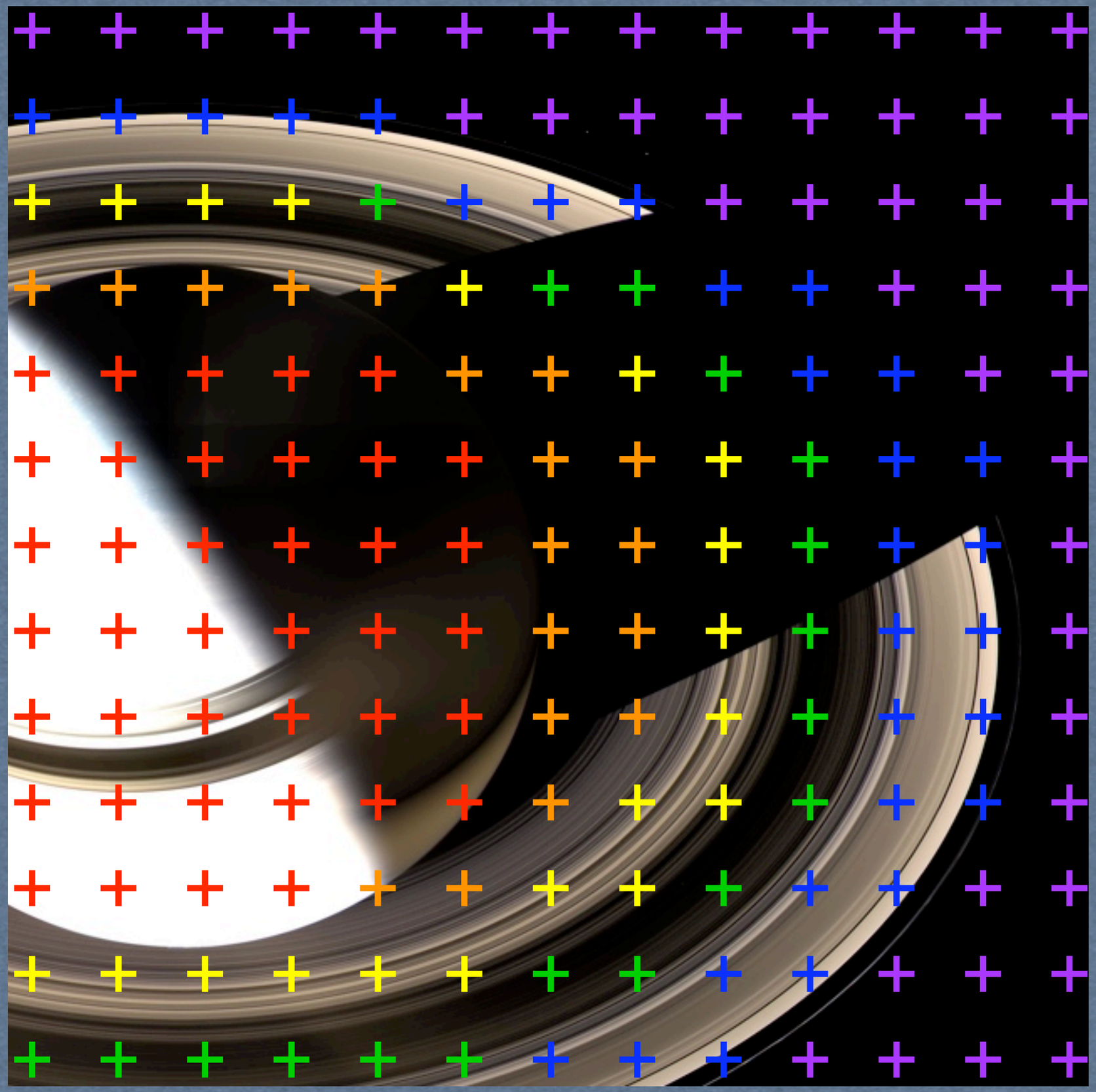
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius

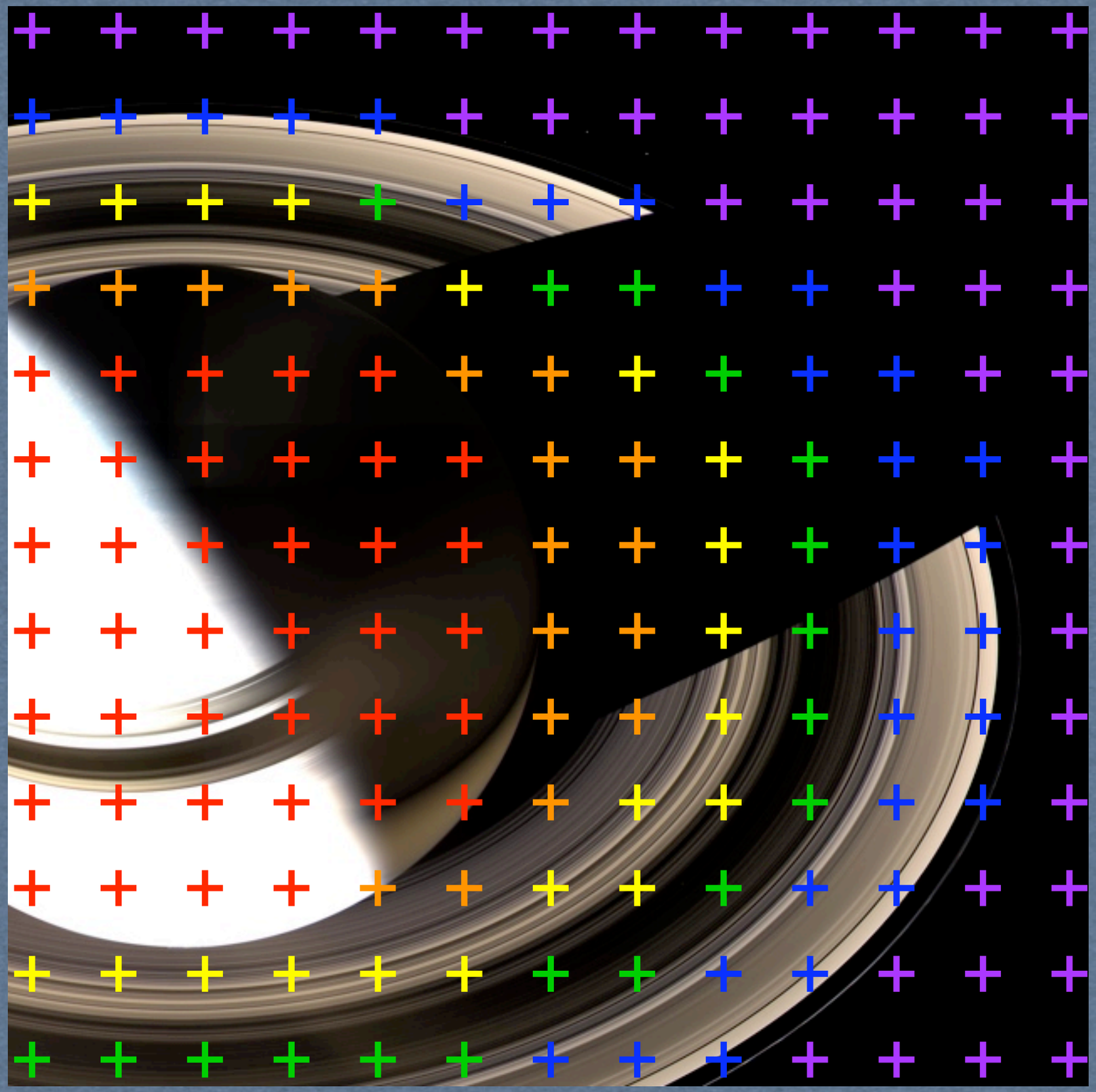
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius

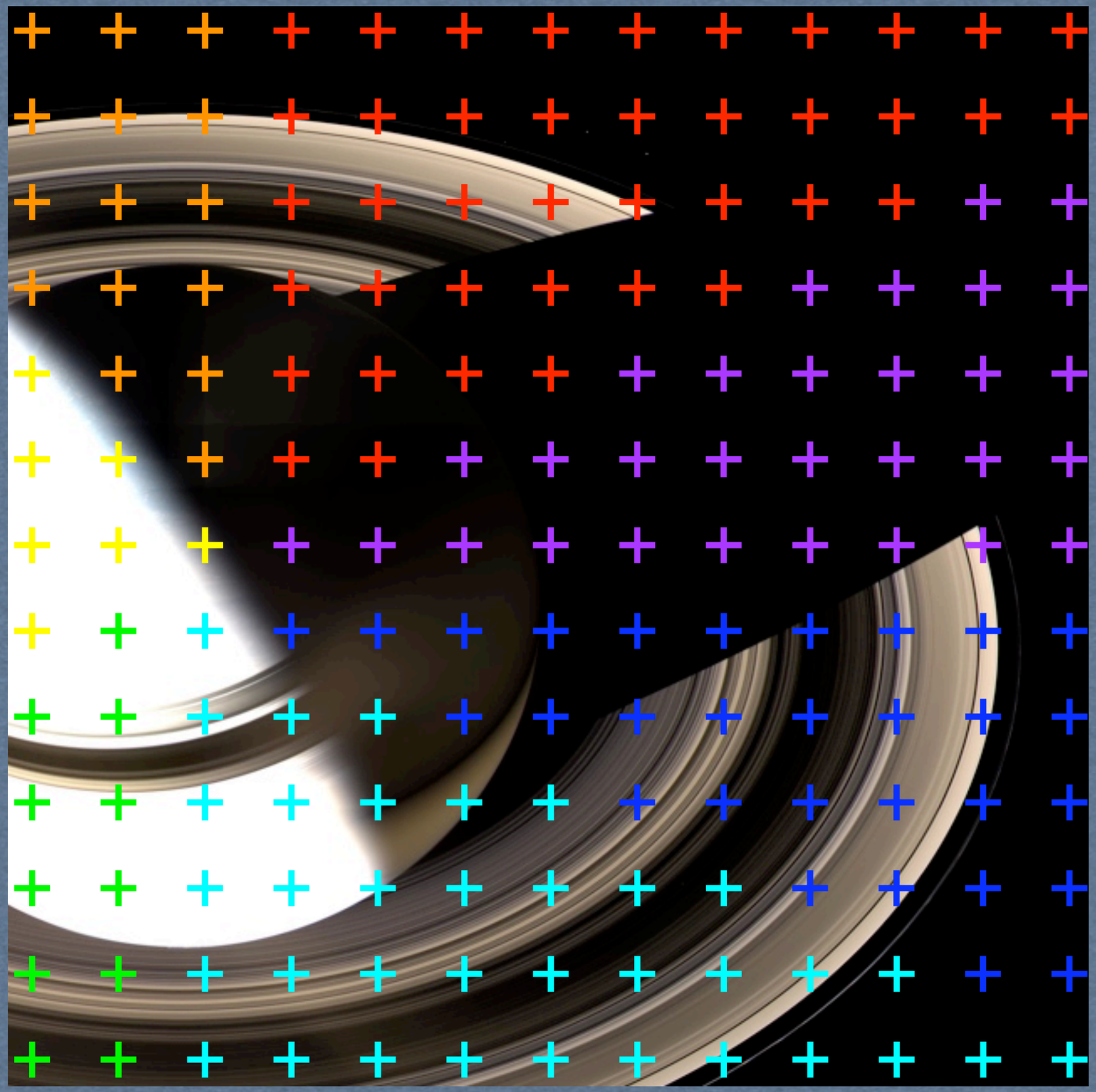
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius
- Orbital longitude
  - w.r.t. to Sun
  - w.r.t. observer
  - w.r.t. shadow boundaries
  - J2000 inertial

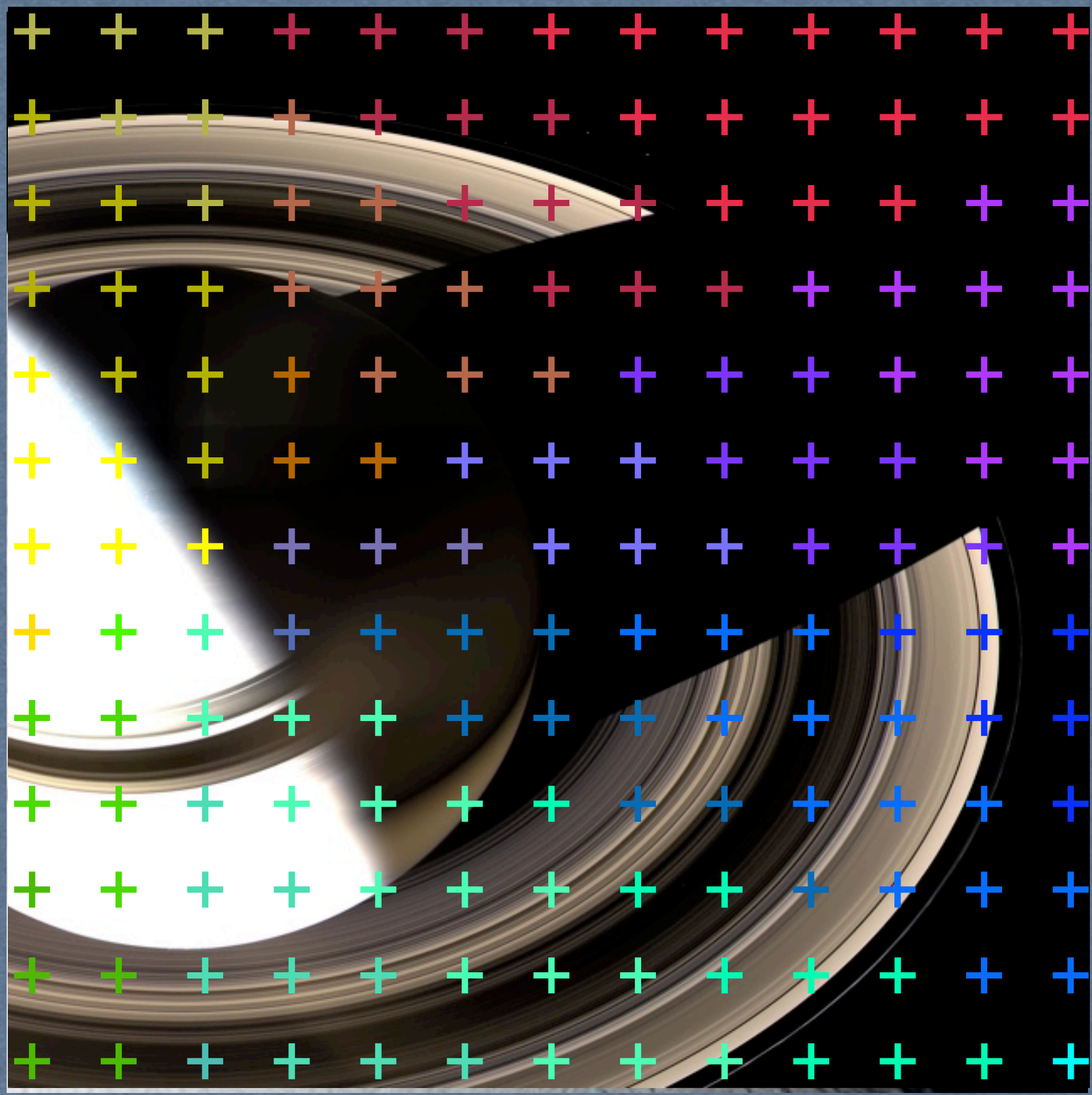
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius
- Orbital longitude
  - w.r.t. to Sun
  - w.r.t. observer
  - w.r.t. shadow boundaries
  - J2000 inertial

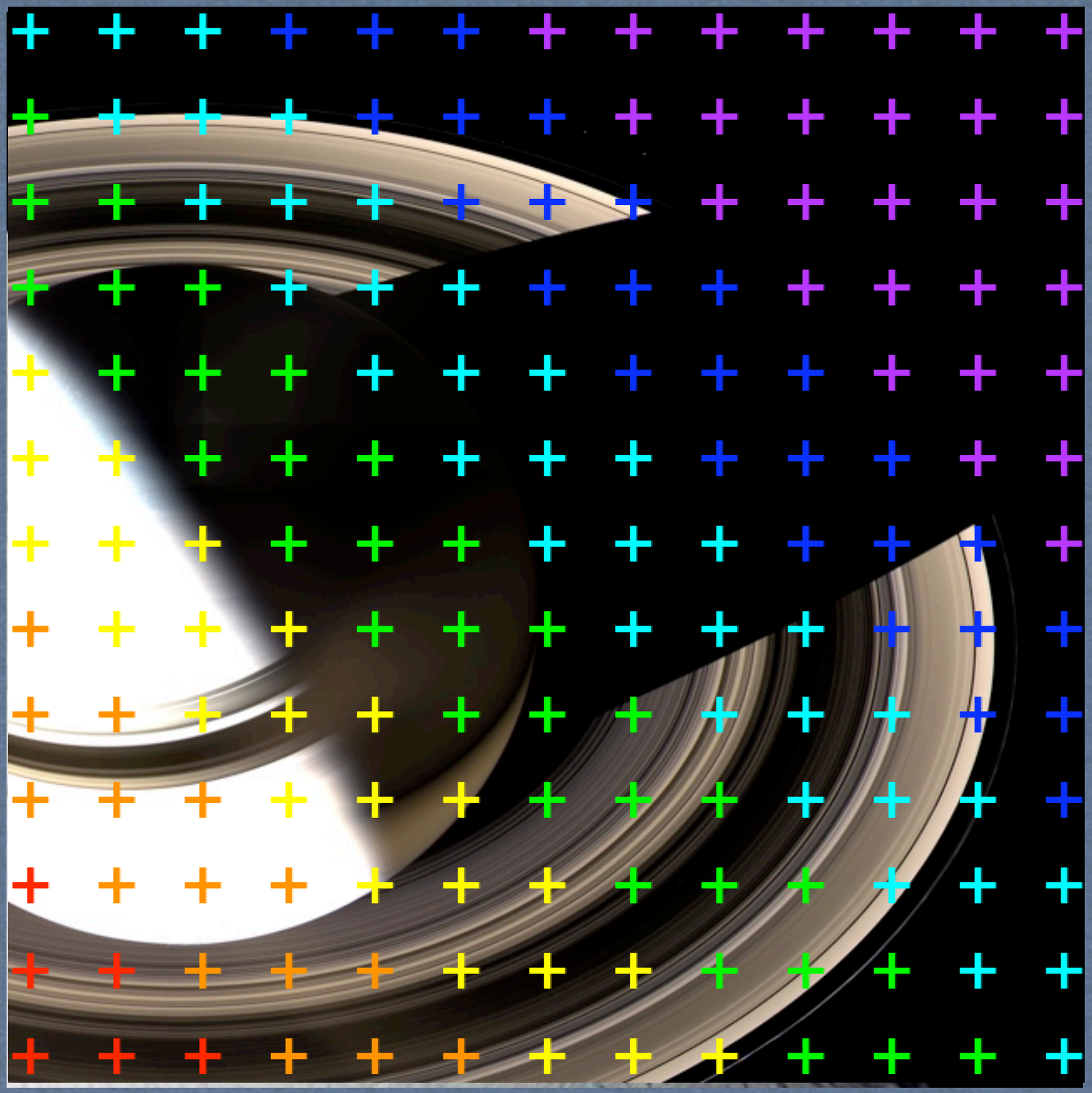
Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius
- Orbital longitude
  - w.r.t. to Sun
  - w.r.t. observer
  - w.r.t. shadow boundaries
  - J2000 inertial
- Phase angle

Internally-Generated Metadata



Sample Metadata...

- Is ring plane visible?
- Is it shadowed?
- Is it sunlit?
- Orbital radius
- Orbital longitude
  - w.r.t. to Sun
  - w.r.t. observer
  - w.r.t. shadow boundaries
  - J2000 inertial
- Phase angle

- [x] General Constraints
- **Ring Geometry Constraints**
- Wavelength Constraints
- Image Constraints
- [x] Cassini Mission Constraints
- Cassini ISS Constraints

Ring Geometry Constraints

▼ Ring Radius

min: max: km look up range add range get endpoints

▶ J2000 Ring Longitude

▶ Sub Observer Ring Longitude

▼ Solar Hour Angle

min: max: add range get endpoints

▼ Ring Resolution

min: max: add range get endpoints

▶ Ring Intercept Time

▶ Range to Ring Intercept

▶ Sub-observer Latitude

▶ Edge-on Intercept Longitude

▼ Phase Angle

min: max: add range get endpoints

▼ Incidence Angle

min: max: add range get endpoints

▼ Emission Angle

min: max: add range get endpoints

▶ Planet Behind Ring Flag

▶ Ring Plane Resolution

▶ Edge-on Ring Radius

▶ Ring Range

▶ Ring Shadow Flag

▶ Edge on Ring Resolution

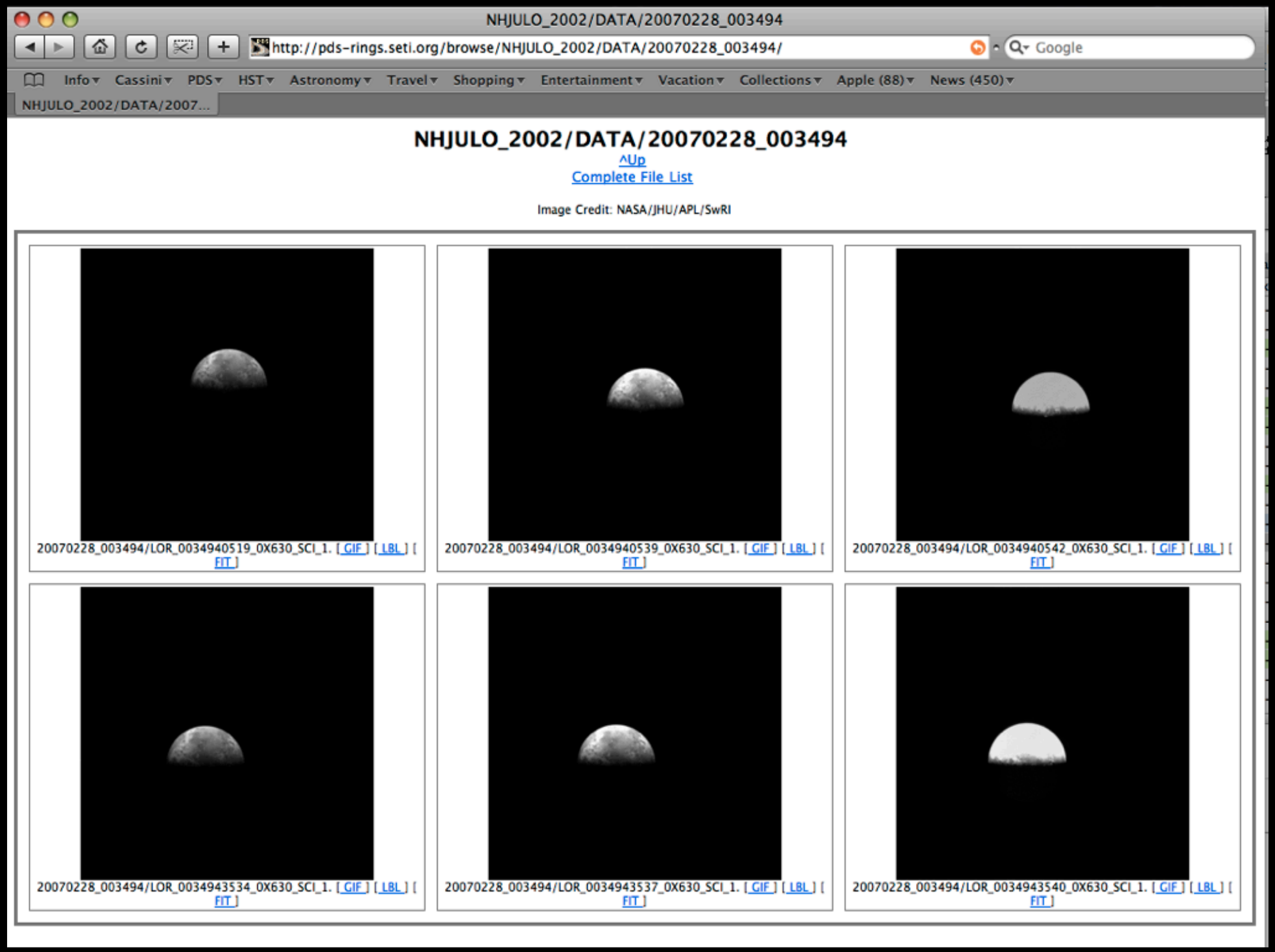
▶ Range to Edge-On Point

▶ Edge On Solar Hour Angle

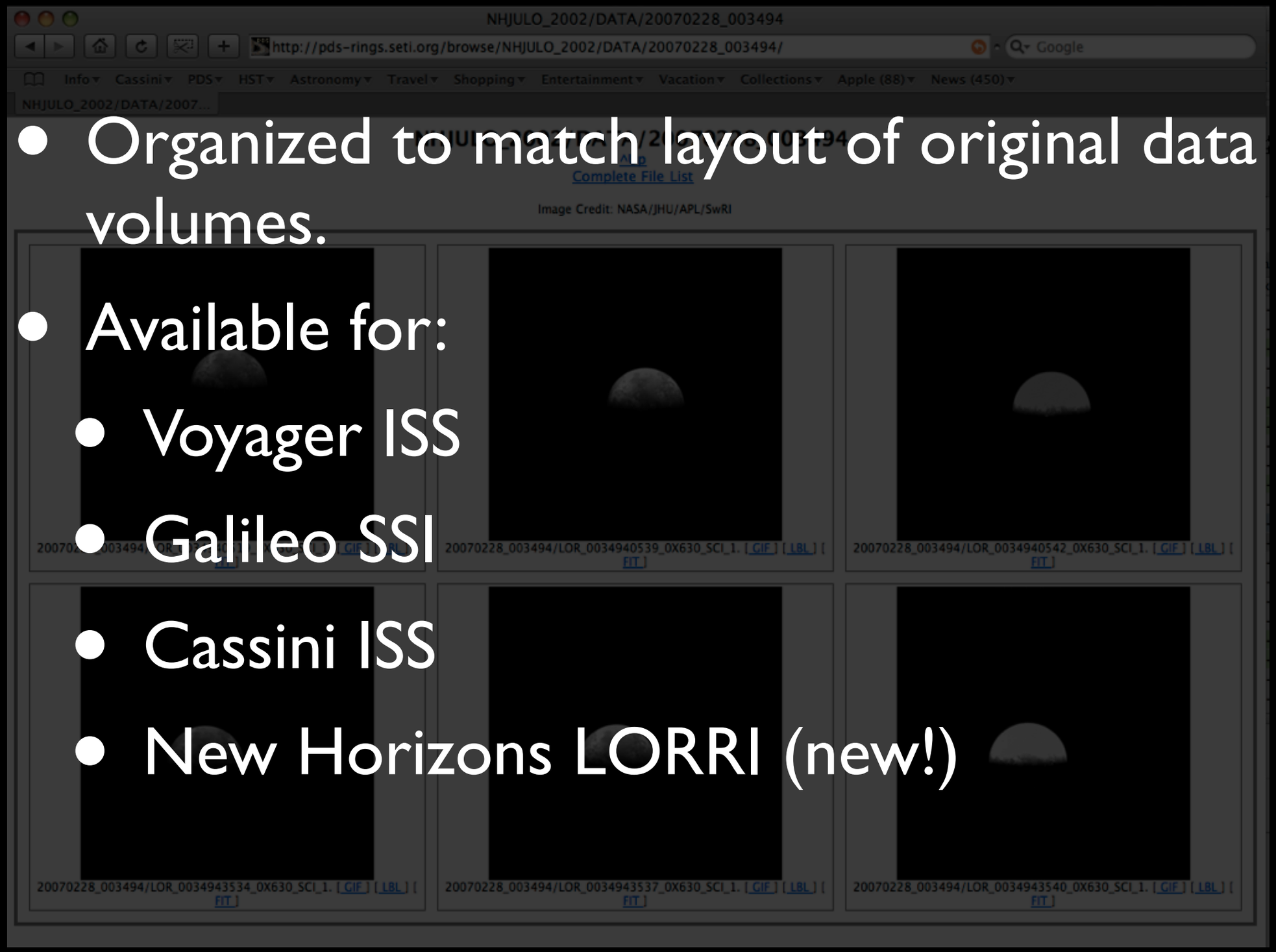
▶ Edge On J2000 Longitude

▶ Edge-On Ring Elevation

On-line Image Browsing



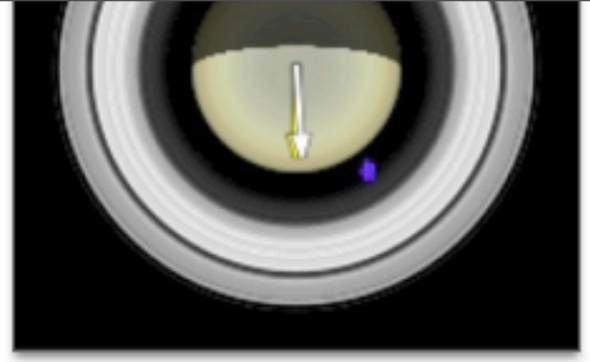
On-line Image Browsing



- Organized to match layout of original data volumes.
- Available for:
  - Voyager ISS
  - Galileo SSI
  - Cassini ISS
  - New Horizons LORRI (new!)

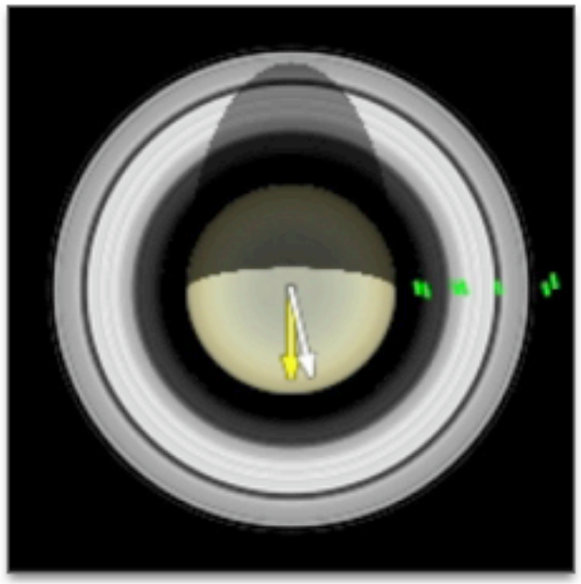
ISPM0702011922_FP1

ISPM0702011922_FP3

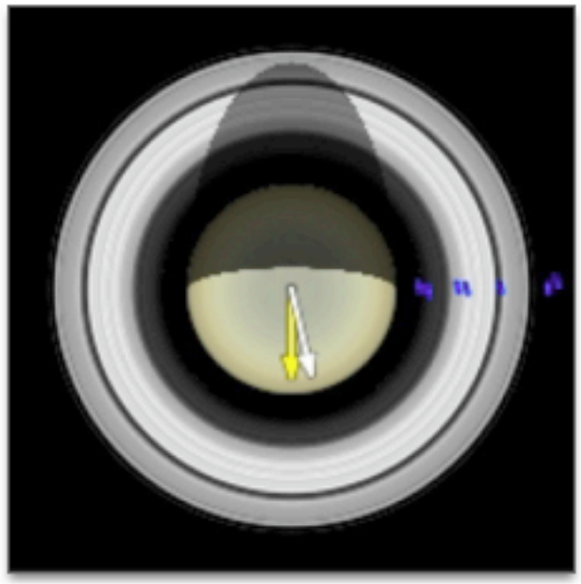


ISPM0702011922_FP4

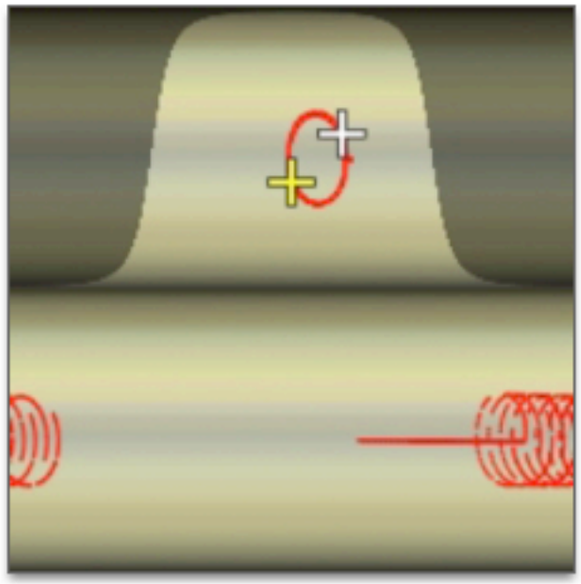
ISPM0702031010_FP1



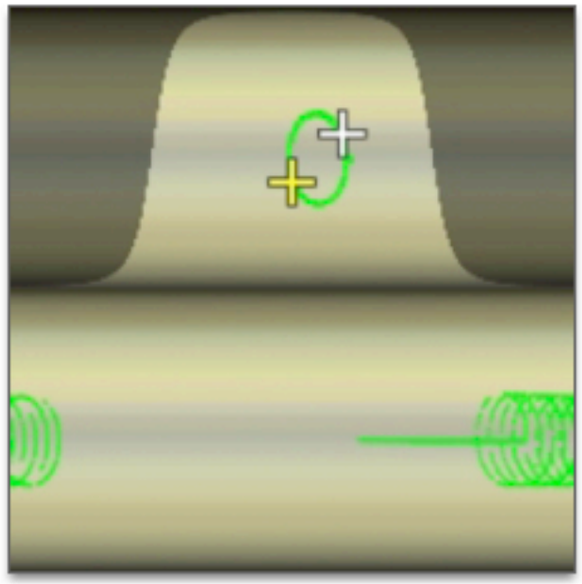
ISPM0702031010_FP3



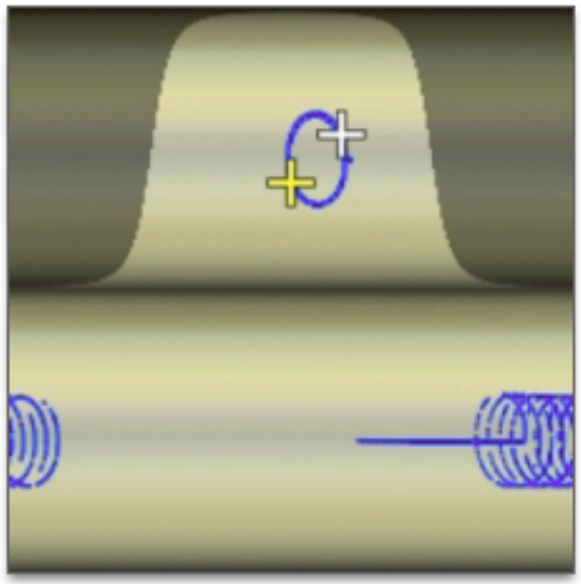
ISPM0702031010_FP4



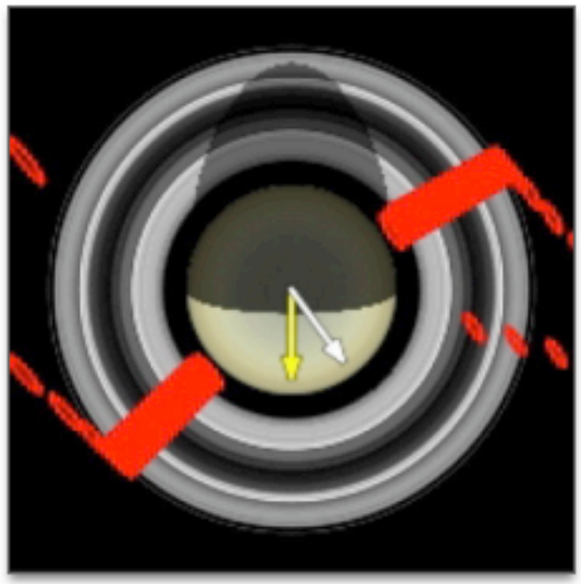
ISPM0702040622_FP1



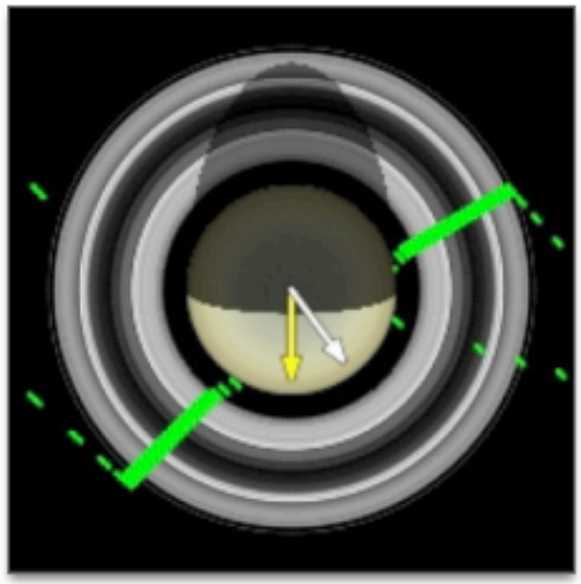
ISPM0702040622_FP3



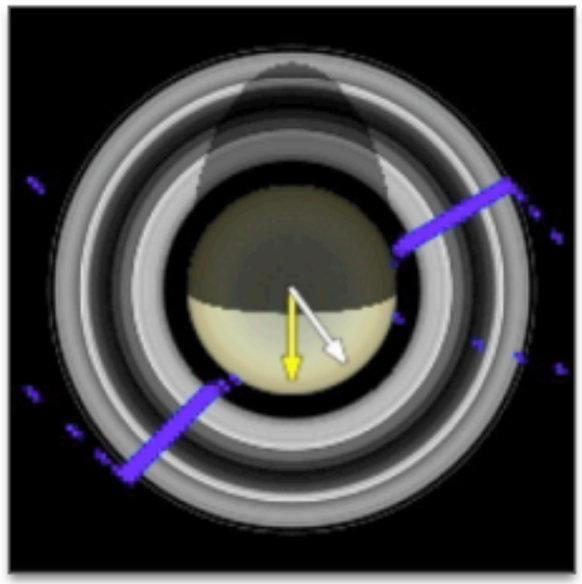
ISPM0702040622_FP4



ISPM0702041407_FP1



ISPM0702041407_FP3



ISPM0702041407_FP4

HST Re-Archiving

- This is "Step 1" toward integrating the HST data set into our catalog.
  - The HST catalog is *NOT* designed for planetary searches.
- So far:
  - WFPC2, ACS, NICMOS and STIS.
  - Pipeline for PDS labels.
  - Pipeline for PDS indices.
- Giant planets only.

  ...but we are not ruling out Mars and Pluto later.

The Great Myth: HST Data Products are “Simple”

- This is the PDS label for one STIS file:
- 49 data objects.
- 983 lines.
- Shown here in its entirety in 3-point font!

```
PDS_VERSION_ID                = PDS3
RECORD_TYPE                   = FIXED_LENGTH
RECORD_BYTES                  = 2880
FILE_RECORDS                  = 29207

"GENERAL_FITS_HEADER          = ("06BA04030_FLT.FITS", 1)
"FUV1_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 8)
"FUV1_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 11)
"FUV1_ERROR_HEADER            = ("06BA04030_FLT.FITS", 1468)
"FUV1_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 1470)
"FUV1_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 2927)
"FUV1_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 2929)
"FUV2_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 3658)
"FUV2_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 3661)
"FUV2_ERROR_HEADER            = ("06BA04030_FLT.FITS", 5118)
"FUV2_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 5120)
"FUV2_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 6577)
"FUV2_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 6579)
"FUV3_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 7308)
"FUV3_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 7311)
"FUV3_ERROR_HEADER            = ("06BA04030_FLT.FITS", 8768)
"FUV3_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 8770)
"FUV3_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 10227)
"FUV3_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 10229)
"FUV4_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 10958)
"FUV4_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 10961)
"FUV4_ERROR_HEADER            = ("06BA04030_FLT.FITS", 12418)
"FUV4_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 12420)
"FUV4_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 13877)
"FUV4_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 13879)
"FUV5_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 14608)
"FUV5_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 14611)
"FUV5_ERROR_HEADER            = ("06BA04030_FLT.FITS", [illegible])
"FUV5_ERROR_IMAGE             = ("06BA04030_FLT.FITS", [illegible])
"FUV5_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 17067)
"FUV5_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 17529)
"FUV6_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 18258)
"FUV6_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 18261)
"FUV6_ERROR_HEADER            = ("06BA04030_FLT.FITS", [illegible])
"FUV6_ERROR_IMAGE             = ("06BA04030_FLT.FITS", [illegible])
"FUV6_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", [illegible])
"FUV6_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", [illegible])
"FUV7_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", [illegible])
"FUV7_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", [illegible])
"FUV7_ERROR_HEADER            = ("06BA04030_FLT.FITS", 23368)
"FUV7_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 23370)
"FUV7_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 24827)
"FUV7_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 24829)
"FUV8_SCIENCE_HEADER          = ("06BA04030_FLT.FITS", 25558)
"FUV8_SCIENCE_IMAGE           = ("06BA04030_FLT.FITS", 25561)
"FUV8_ERROR_HEADER            = ("06BA04030_FLT.FITS", 27018)
"FUV8_ERROR_IMAGE             = ("06BA04030_FLT.FITS", 27020)
"FUV8_DATA_QUALITY_HEADER     = ("06BA04030_FLT.FITS", 28477)
"FUV8_DATA_QUALITY_IMAGE      = ("06BA04030_FLT.FITS", 28479)

DATA_SET_ID                   = "HST-J-STIS-2/3-ID8657-V1.0"
RING_OBSERVATION_ID           = "J/IMG/HST/STIS/2000-12-18/06BA04030/FUV"
PRODUCT_ID                    = "06BA04030_FLT.FITS"
PRODUCT_TYPE                  = CALIBRATED_IMAGE
PRODUCT_CREATION_TIME         = 2007-01-18T11:07:13
SOURCE_PRODUCT_ID             = "06BA04030_RAW.FITS"

SPACECRAFT_NAME               = "HUBBLE SPACE TELESCOPE"
SPACECRAFT_ID                 = HST
INSTRUMENT_NAME               = "SPACE TELESCOPE IMAGING SPECTROGRAPH"
INSTRUMENT_ID                 = STIS
OBSERVATION_TYPE              = IMAGE
DETECTORS                     = 1
DETECTOR_ID                   = FUV-MAMA
TARGET_NAME                   = "JUPITER"
FILTER_NAME                   = "CLEAR"
DISPERSION_MODE_ID            = "N/A"
GAIN_MODE_ID                  = "A2D1"
INSTRUMENT_MODE_ID            = "ACCUM"
DATA_QUALITY_DESC             = "OK"

START_TIME                    = 2000-12-18T12:30:29
STOP_TIME                     = 2000-12-18T12:55:53
EXPOSURE_DURATION             = 800. <SECONDS>

CENTER_FILTER_WAVELENGTH      = 0.1374 <MICROMETERS>
MINIMUM_WAVELENGTH            = 0.1140 <MICROMETERS>
MAXIMUM_WAVELENGTH            = 0.1740 <MICROMETERS>
BANDWIDTH                     = 0.0138 <MICROMETERS>

NOTE                          = "
This file contains calibrated STIS data obtained from the FUV-MAMA detector,
operating in ACCUM mode. The file is in FITS format.

The file is organized as a single global FITS header followed by a sequence of
8 blocks of scientific data. A block is structured as follows:
  1: A FITS extension header describing the science data to follow.
  2: Science data: A 2-D binary image.
  3: A FITS extension header describing the error data to follow.
  4: Error array, organized identically to the science data but describing
     the statistical uncertainty in each value.
  5: A FITS extension header describing the data quality array to follow.
  6: Data quality array, organized identically to the science data but
     encoding information about the quality of each scientific value.
See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about this file and
its processing history.

Further cataloging information:

       HST Proposal ID: 8657
        P.I. Last name: CLARKE
     HST Target name: JUP-SOUTH
     PDS Target name: JUPITER
           Planet name: JUPITER

        Instrument ID: STIS
    Observation type: IMAGE
          Detector ID: FUV-MAMA
       Aperture type: 25MAMA
  Targeted detector: FUV-MAMA

          Filter name: CLEAR
        Grating name: N/A
   Center wavelength: 0.1374
 Minimum wavelength: 0.1140
 Maximum wavelength: 0.1740
       Full bandwidth: 0.0138
Wavelength resolution: 0.0600

          Gain mode: A2D1
    Instrument mode: ACCUM
      Exposure type: NORMAL
      PGS lock type: FINE
       Data quality: OK

            Subarray: FALSE
     Central pixel X: 513
     Central pixel Y: 513
     Subarray size X: 1024
     Subarray size Y: 1024
     Pixels binned X: 1
     Pixels binned Y: 1

    Repeat exposures: 8
           CR splits: N/A
         File layers: 8

Note:
NO APPARENT PROBLEMS
"

OBJECT                        = GLOBAL_FITS_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 7
  BYTES                       = 20160
  DESCRIPTION                 = "A FITS header describing general properties
    of this data product, but not containing data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the parameters in this
    header. See DOCUMENT/FITSINFO.TXT for a description of the FITS file
    format."
END_OBJECT                    = GLOBAL_FITS_HEADER

OBJECT                        = FUV1_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV1_SCIENCE_HEADER

OBJECT                        = FUV1_SCIENCE_IMAGE
  NAME                        = "FUV1 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:30:29
  STOP_TIME                   = 2000-12-18T12:32:09
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C1Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV1_SCIENCE_IMAGE

OBJECT                        = FUV1_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV1_ERROR_HEADER

OBJECT                        = FUV1_ERROR_IMAGE
  NAME                        = "FUV1 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV1_ERROR_IMAGE

OBJECT                        = FUV1_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV1_DATA_QUALITY_HEADER

OBJECT                        = FUV1_DATA_QUALITY_IMAGE
  NAME                        = "FUV1 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from Table 2.8 of the handbook):

  Bit  Meaning
-----  ------------------------------------------------------------
    1: Error in Reed-Solomon decoding.
    2: Lost data replaced by fill values.
    4: Bad detector pixel.
    8: Data masked by occulting bar.
   16: Pixel having dark rate > 5 sigma times the median dark level.
   32: Large blemish, depth > 40% of the normalized p-flat.
   64: Reserved.
  128: Pixel in overscan region.
  256: Saturated pixel, count rate at 90% of max possible.
  512: Bad pixel in reference file.
 1024: Small blemish, depth between 40% and 70% of normalized flat.
 2048: >30% of background pixels rejected by sigma-clip, or flagged,
       during 1-D spectral extraction.
 4096: Extracted flux affected by bad input data.
 8192: Data rejected in input pixel during image combination for cosmic
       ray rejection.
16384: Extracted flux not CTI corrected because gross counts are <= 0..

Values of zero indicate no known error."
END_OBJECT                    = FUV1_DATA_QUALITY_IMAGE

OBJECT                        = FUV2_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV2_SCIENCE_HEADER

OBJECT                        = FUV2_SCIENCE_IMAGE
  NAME                        = "FUV2 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:32:11
  STOP_TIME                   = 2000-12-18T12:34:11
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C2Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV2_SCIENCE_IMAGE

OBJECT                        = FUV2_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV2_ERROR_HEADER

OBJECT                        = FUV2_ERROR_IMAGE
  NAME                        = "FUV2 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV2_ERROR_IMAGE

OBJECT                        = FUV2_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV2_DATA_QUALITY_HEADER

OBJECT                        = FUV2_DATA_QUALITY_IMAGE
  NAME                        = "FUV2 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from Table 2.8 of the handbook):

  Bit  Meaning
-----  ------------------------------------------------------------
    1: Error in Reed-Solomon decoding.
    2: Lost data replaced by fill values.
    4: Bad detector pixel.
    8: Data masked by occulting bar.
   16: Pixel having dark rate > 5 sigma times the median dark level.
   32: Large blemish, depth > 40% of the normalized p-flat.
   64: Reserved.
  128: Pixel in overscan region.
  256: Saturated pixel, count rate at 90% of max possible.
  512: Bad pixel in reference file.
 1024: Small blemish, depth between 40% and 70% of normalized flat.
 2048: >30% of background pixels rejected by sigma-clip, or flagged,
       during 1-D spectral extraction.
 4096: Extracted flux affected by bad input data.
 8192: Data rejected in input pixel during image combination for cosmic
       ray rejection.
16384: Extracted flux not CTI corrected because gross counts are <= 0..

Values of zero indicate no known error."
END_OBJECT                    = FUV2_DATA_QUALITY_IMAGE

OBJECT                        = FUV3_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV3_SCIENCE_HEADER

OBJECT                        = FUV3_SCIENCE_IMAGE
  NAME                        = "FUV3 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:34:45
  STOP_TIME                   = 2000-12-18T12:41:25
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C3Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV3_SCIENCE_IMAGE

OBJECT                        = FUV3_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV3_ERROR_HEADER

OBJECT                        = FUV3_ERROR_IMAGE
  NAME                        = "FUV3 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV3_ERROR_IMAGE

OBJECT                        = FUV3_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV3_DATA_QUALITY_HEADER

OBJECT                        = FUV3_DATA_QUALITY_IMAGE
  NAME                        = "FUV3 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from Table 2.8 of the handbook):

  Bit  Meaning
-----  ------------------------------------------------------------
    1: Error in Reed-Solomon decoding.
    2: Lost data replaced by fill values.
    4: Bad detector pixel.
    8: Data masked by occulting bar.
   16: Pixel having dark rate > 5 sigma times the median dark level.
   32: Large blemish, depth > 40% of the normalized p-flat.
   64: Reserved.
  128: Pixel in overscan region.
  256: Saturated pixel, count rate at 90% of max possible.
  512: Bad pixel in reference file.
 1024: Small blemish, depth between 40% and 70% of normalized flat.
 2048: >30% of background pixels rejected by sigma-clip, or flagged,
       during 1-D spectral extraction.
 4096: Extracted flux affected by bad input data.
 8192: Data rejected in input pixel during image combination for cosmic
       ray rejection.
16384: Extracted flux not CTI corrected because gross counts are <= 0..

Values of zero indicate no known error."
END_OBJECT                    = FUV3_DATA_QUALITY_IMAGE

OBJECT                        = FUV4_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV4_SCIENCE_HEADER

OBJECT                        = FUV4_SCIENCE_IMAGE
  NAME                        = "FUV4 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:39:45
  STOP_TIME                   = 2000-12-18T12:41:25
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C4Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV4_SCIENCE_IMAGE

OBJECT                        = FUV4_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV4_ERROR_HEADER

OBJECT                        = FUV4_ERROR_IMAGE
  NAME                        = "FUV4 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV4_ERROR_IMAGE

OBJECT                        = FUV4_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV4_DATA_QUALITY_HEADER

OBJECT                        = FUV4_DATA_QUALITY_IMAGE
  NAME                        = "FUV4 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from Table 2.8 of the handbook):

  Bit  Meaning
-----  ------------------------------------------------------------
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    8: Data masked by occulting bar.
   16: Pixel having dark rate > 5 sigma times the median dark level.
   32: Large blemish, depth > 40% of the normalized p-flat.
   64: Reserved.
  128: Pixel in overscan region.
  256: Saturated pixel, count rate at 90% of max possible.
  512: Bad pixel in reference file.
 1024: Small blemish, depth between 40% and 70% of normalized flat.
 2048: >30% of background pixels rejected by sigma-clip, or flagged,
       during 1-D spectral extraction.
 4096: Extracted flux affected by bad input data.
 8192: Data rejected in input pixel during image combination for cosmic
       ray rejection.
16384: Extracted flux not CTI corrected because gross counts are <= 0..

Values of zero indicate no known error."
END_OBJECT                    = FUV4_DATA_QUALITY_IMAGE

OBJECT                        = FUV5_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV5_SCIENCE_HEADER

OBJECT                        = FUV5_SCIENCE_IMAGE
  NAME                        = "FUV5 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:46:59
  STOP_TIME                   = 2000-12-18T12:48:39
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C5Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV5_SCIENCE_IMAGE

OBJECT                        = FUV5_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV5_ERROR_HEADER

OBJECT                        = FUV5_ERROR_IMAGE
  NAME                        = "FUV5 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV5_ERROR_IMAGE

OBJECT                        = FUV5_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV5_DATA_QUALITY_HEADER

OBJECT                        = FUV5_DATA_QUALITY_IMAGE
  NAME                        = "FUV5 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from Table 2.8 of the handbook):

  Bit  Meaning
-----  ------------------------------------------------------------
    1: Error in Reed-Solomon decoding.
    2: Lost data replaced by fill values.
    4: Bad detector pixel.
    8: Data masked by occulting bar.
   16: Pixel having dark rate > 5 sigma times the median dark level.
   32: Large blemish, depth > 40% of the normalized p-flat.
   64: Reserved.
  128: Pixel in overscan region.
  256: Saturated pixel, count rate at 90% of max possible.
  512: Bad pixel in reference file.
 1024: Small blemish, depth between 40% and 70% of normalized flat.
 2048: >30% of background pixels rejected by sigma-clip, or flagged,
       during 1-D spectral extraction.
 4096: Extracted flux affected by bad input data.
 8192: Data rejected in input pixel during image combination for cosmic
       ray rejection.
16384: Extracted flux not CTI corrected because gross counts are <= 0..

Values of zero indicate no known error."
END_OBJECT                    = FUV5_DATA_QUALITY_IMAGE

OBJECT                        = FUV6_SCIENCE_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 3
  BYTES                       = 8640
  DESCRIPTION                 = "A FITS extension header for the science
    data object to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions
    of the parameters in this header. See DOCUMENT/FITSINFO.TXT for a
    description of the FITS file format."
END_OBJECT                    = FUV6_SCIENCE_HEADER

OBJECT                        = FUV6_SCIENCE_IMAGE
  NAME                        = "FUV6 SCIENCE IMAGE"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  HORIZONTAL_PIXEL_FOV        = 0.00000694 <DEGREES> /* 0.025 arcsec */
  VERTICAL_PIXEL_FOV          = 0.00000694 <DEGREES> /* 0.025 arcsec */
  HORIZONTAL_FOV              = 0.00711    <DEGREES> /* 25.6 arcsec */
  VERTICAL_FOV                = 0.00711    <DEGREES> /* 25.6 arcsec */
  SAMPLE_DISPLAY_DIRECTION    = RIGHT
  LINE_DISPLAY_DIRECTION      = UP
  START_TIME                  = 2000-12-18T12:54:13
  STOP_TIME                   = 2000-12-18T12:55:53
  EXPOSURE_DURATION           = 100. <SECONDS>
  PRODUCT_ID                  = "06BA04C6Q_FLT.FITS" /* STScI Internal */
  RIGHT_ASCENSION             =  61.657305
  DECLINATION                 =  20.006877
  TWIST_ANGLE                 = 185.921410
  DESCRIPTION                 = "Image data. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV6_SCIENCE_IMAGE

OBJECT                        = FUV6_ERROR_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the error array
    to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for definitions of the
    parameters in this header. See DOCUMENT/FITSINFO.TXT for a description of
    the FITS file format."
END_OBJECT                    = FUV6_ERROR_HEADER

OBJECT                        = FUV6_ERROR_IMAGE
  NAME                        = "FUV6 ERROR ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = IEEE_REAL
  SAMPLE_BITS                 = 32
  DESCRIPTION                 = "Error array for the science data above. See
    DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS image
    files."
END_OBJECT                    = FUV6_ERROR_IMAGE

OBJECT                        = FUV6_DATA_QUALITY_HEADER
  HEADER_TYPE                 = FITS
  INTERCHANGE_FORMAT          = ASCII
  RECORDS                     = 2
  BYTES                       = 5760
  DESCRIPTION                 = "A FITS extension header for the data
    quality array to follow. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for
    definitions of the parameters in this header. See DOCUMENT/FITSINFO.TXT
    for a description of the FITS file format."
END_OBJECT                    = FUV6_DATA_QUALITY_HEADER

OBJECT                        = FUV6_DATA_QUALITY_IMAGE
  NAME                        = "FUV6 DATA QUALITY ARRAY"
  LINES                       = 1024
  LINE_SAMPLES                = 1024
  SAMPLE_TYPE                 = MSB_INTEGER
  SAMPLE_BITS                 = 16
  DESCRIPTION                 = "Data quality array for the science data
    above. See DOCUMENT/STIS_LONG_HANDBOOK.PDF for more information about STIS
    image files.

Each bit has the following meaning (from
```

“Spinlabels”

- A tool for generating PDS labels.
- A “difference” file contains parameters & values for each label needed.
- A “template” describes the label to be generated.
  - Supports variables, loops, if/then/else clauses, “include” files, text wrapping, numeric and time arithmetic, arrays, string manipulations, ...
- This tool may be useful to other nodes.

Voyager Support Activities

- C kernels
  - C-smithed kernel for Voyager 1 Saturn is on line.
  - Others are available without C-smithing.
- ISS calibrated data set
  - Saturn data set was peer reviewed but some problems were identified.
- IRIS extended data set
  - Encompass complete data from the Jupiter and Saturn encounters.

Cassini Support Activities

- CIRS re-formatted volumes
  - No more dreaded variable-length records.
  - Paraphrasing Conor Nixon: "This is probably the file format we should have used from the outset."
- ISS Calibration
  - A prototype calibration pipeline has been tested and debugged.
- VIMS Cube Calibration
  - Feasibility is uncertain.