OPUS

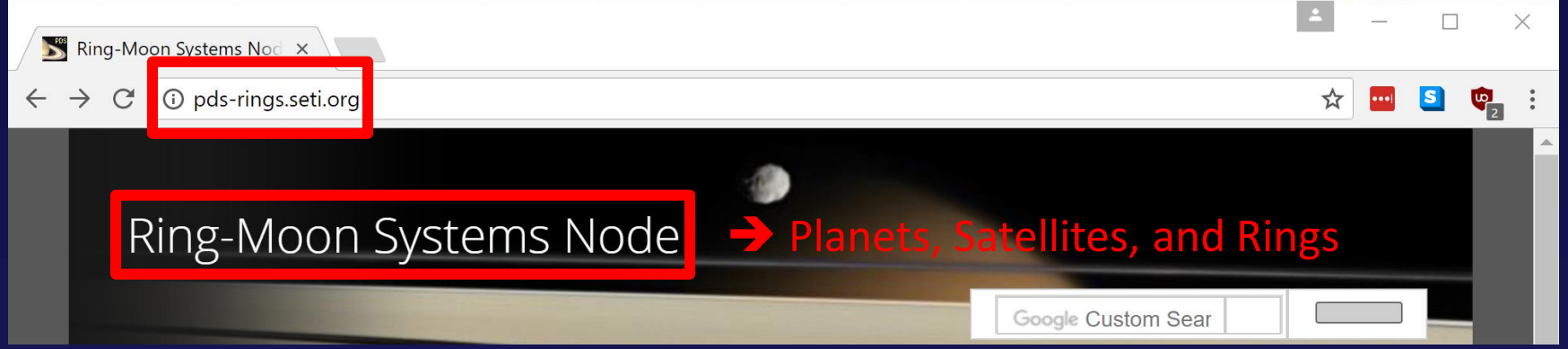
(Outer Planet Unified Search)

A Comprehensive Search Tool for Remote Sensing Observations of the Outer Planets
Now with Enhanced Geometric Metadata for
Cassini and New Horizons Optical Remote Sensing Instruments

M. K. Gordon, M. R. Showalter, L. Ballard,
M. Tiscareno, R. S. French, D. Olson

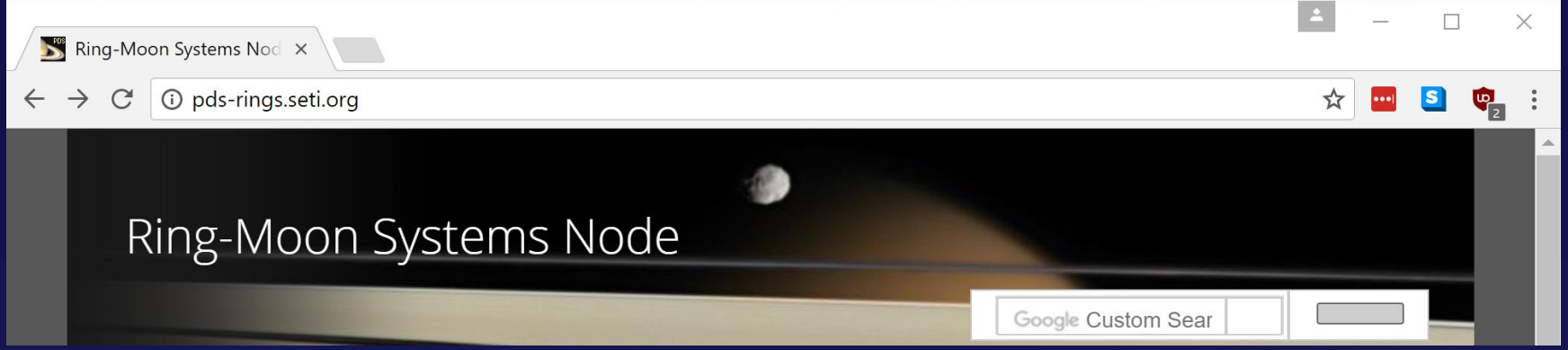
SETI INSTITUTE

3rd Planetary Data Workshop – Flagstaff, AZ
June 13, 2017



- Your first stop for ... DATA, TOOLS, and INFORMATION
  - Jupiter, Saturn, Uranus, Neptune, Pluto
    - Plus a little Venus, Earth, and Mars
  - Cassini: CIRS[1], ISS, UVIS, VIMS
  - New Horizons: LORRI, MVIC
  - Galileo: SSI[2]
  - Voyager 1 and 2: ISS
  - HST: ACS, WFC3, WFPC2, STIS[3]
- But not dust data (SBN) or plasma, fields, and particle data (PPI)

[1] CIRS observations before July 1, 2010; [2] Subset of full Galileo SSI observations;
[3] HST STIS available by early July



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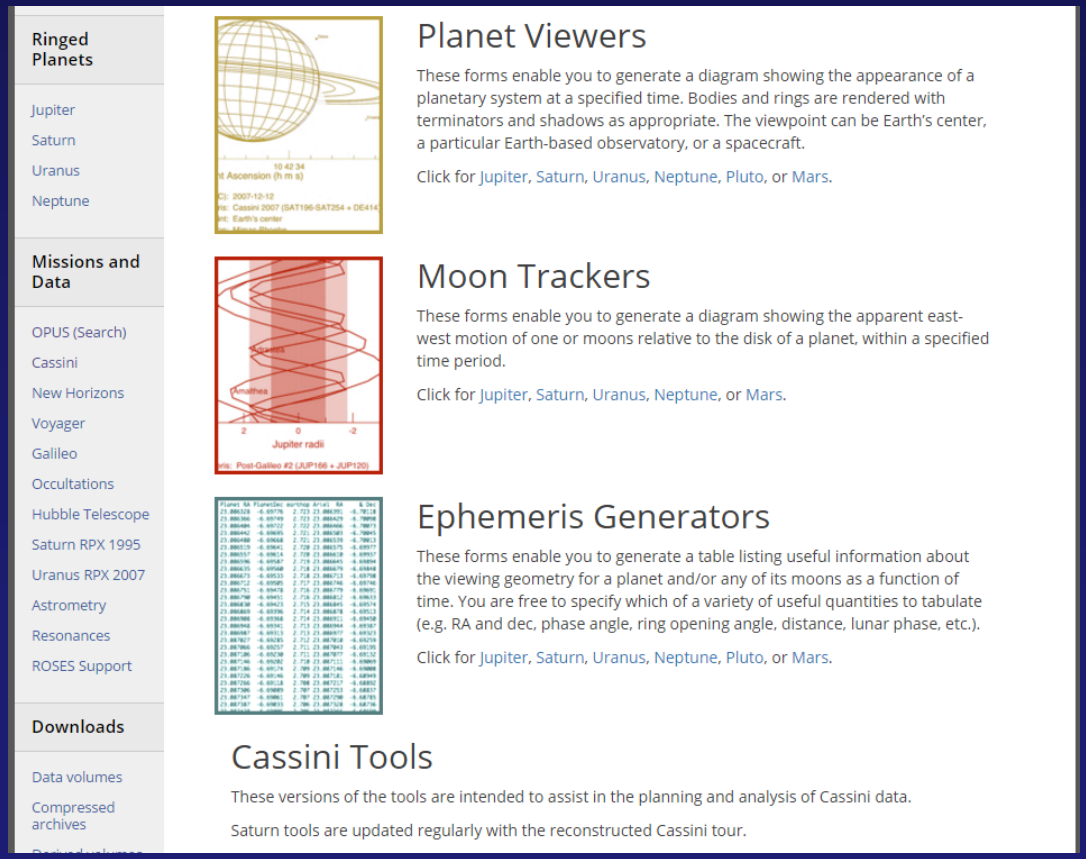
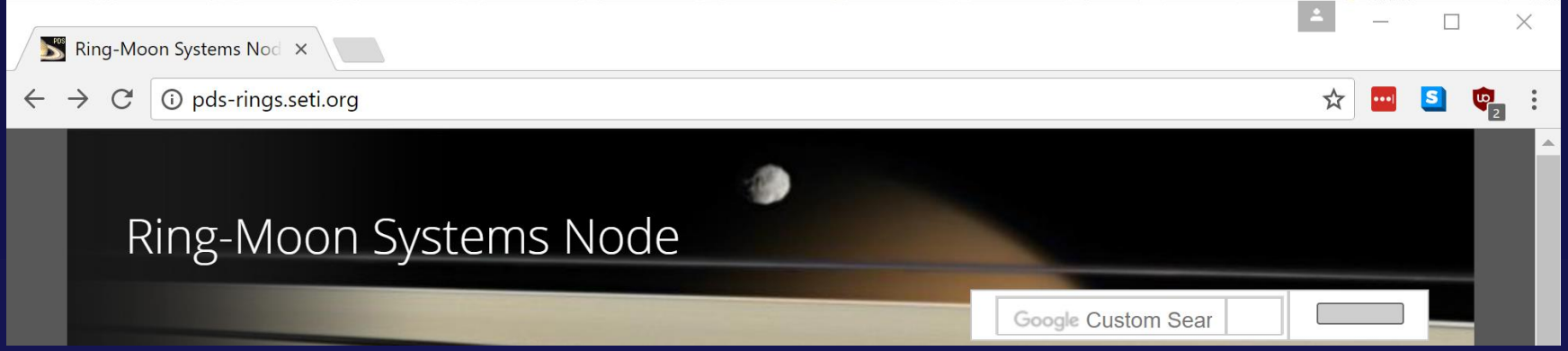
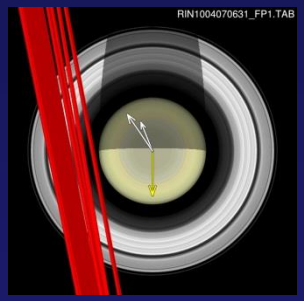


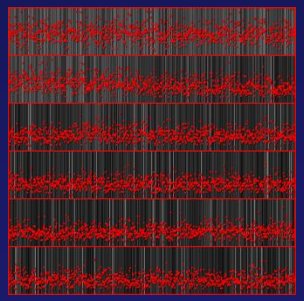
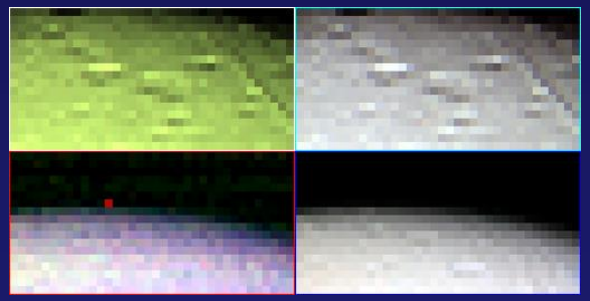


- Your first stop for … DATA, TOOLS, and INFORMATION
  - Research proposal support – ROSES 2017 (CDAP, DDAP, NFDAP, PDART, SSW)
  - Cassini user's guides
  - Information on outer planets and spacecraft instruments

Special Features

- Complete downloadable archives (.tar.gz)
- Calibrated images for Cassini ISS and Voyager ISS
- Cassini and Voyager occultation profiles
- Thumbnail browse products for *all* instrument types

- Enhanced geometric metadata
  - Cassini: ISS, UVIS, VIMS
  - New Horizons: LORRI
  - Voyager 1 and 2: ISS (outer planets)
    - Uranus and Neptune added just last week!

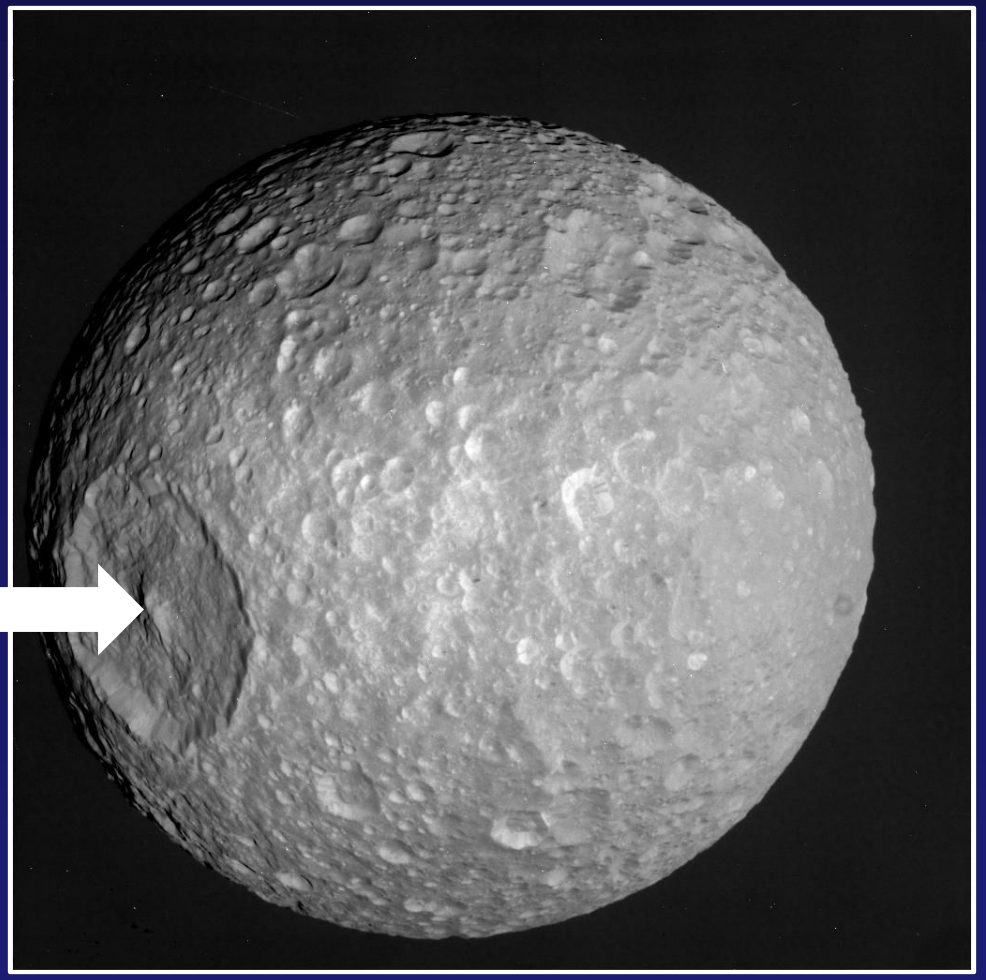
OPUS Demonstration

<u>GOAL</u>

Find hi-resolution images of Herschel Crater on Mimas

Latitude 0°

Longitude 100°



Ring-Moon Systems Nod

pds-rings.seti.org

Ring-Moon Systems Node

Google Custom Sear

Cassini News

Cassini Mission (JPL)

Press Release Images

Data and Information

Ringed Planets

Jupiter

Saturn

Uranus

Neptune

Missions and Data

The Ring-Moon Systems Node of NASA's Planetary Data System is devoted to archiving, cataloging, and distributing scientific data sets relevant to planetary ring systems.

OPUS Data Search

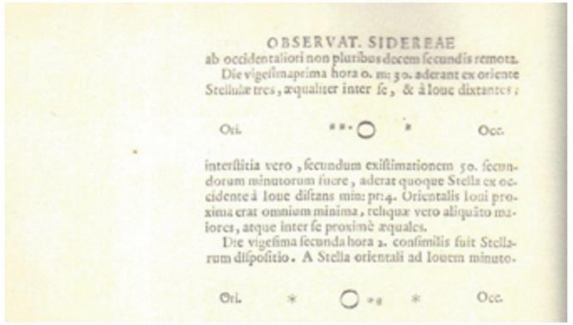
OPUS - Our Data Search Tool

Now supports New Horizons LORRI Jupiter and Pluto data. New Horizons MVIC support coming soon.

- The OPUS API can be accessed directly. See instructions in the OPUS API Guide.

Includes enhanced geometric metadata for Cassini ISS, UVIS, and VIMS Saturn and Jupiter data

Our generic Ephemeris Tools now work for any year between 1601 and 2599.


OBSERVAT. SIDEREAE

ab occidentaliori non pluribus decem fecundis remota.

Die vigesimaprima hora 0. m. 30. aderant ex oriente Stellulæ tres, æqualiter inter se, & à Ioue distantes:

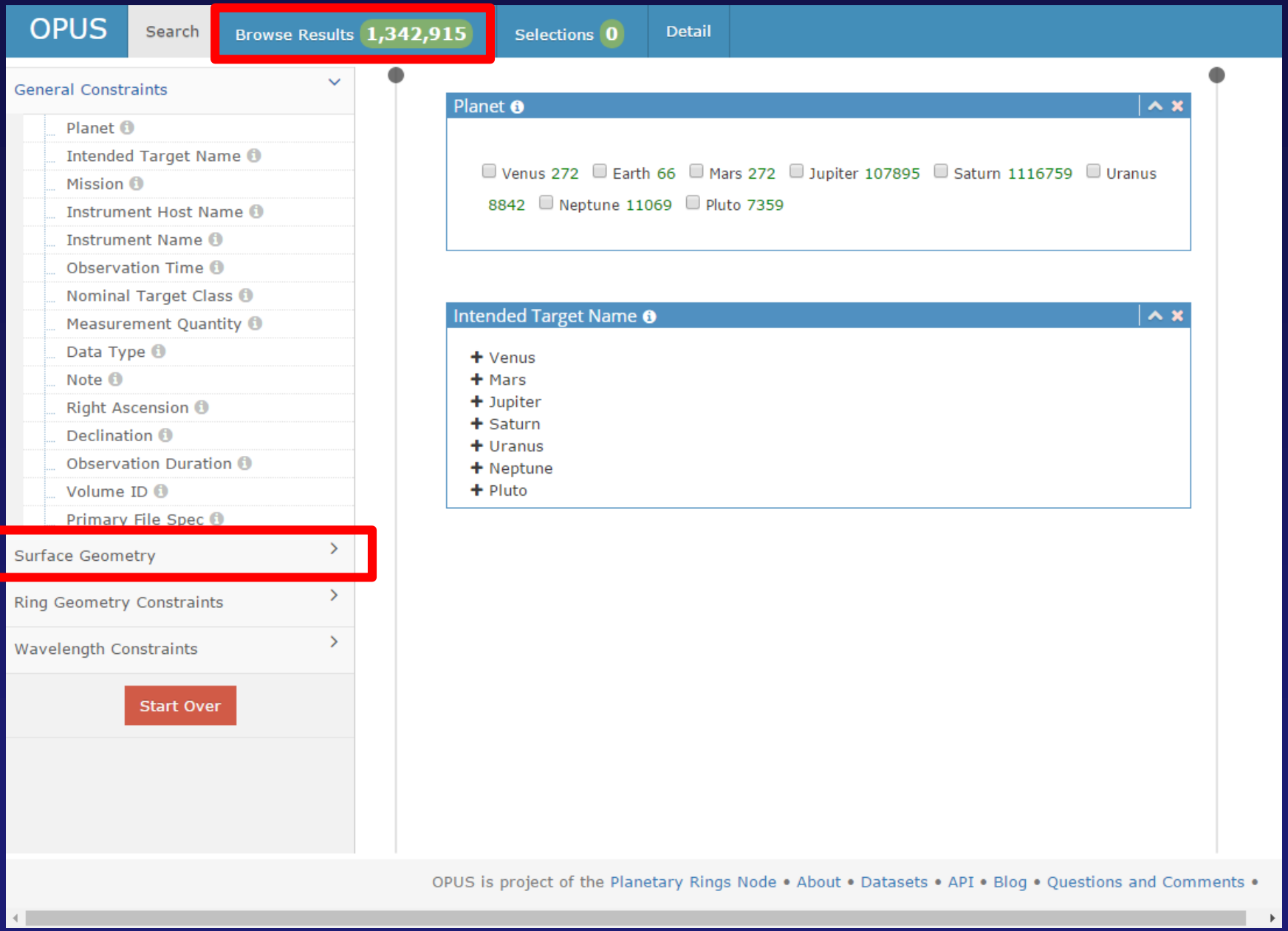
Ori. Occ.

interstitia vero, secundum existimationem 30. secundorum minutorum fuere, aderat quoque Stella ex occidente à Ioue distans min. pr. 4. Orientalis Ioui proxima erat omnium minima, reliquæ vero aliquanto maiores, atque inter se proximè æquales.

Die vigesima secunda hora 2. consimilis fuit Stellarum dispositio. A Stella orientali ad Iouem minuto.

Ori. Occ.

Click the image (pdf) to see Galileo's observations from January 21 & 22, 1610 and the results from the Moon Tracker and Planet Viewer.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General Constraints
Planet
Intended Target Name
Mission
Instrument Host Name
Instrument Name
Observation Time
Nominal Target Class
Measurement Quantity
Data Type
Note
Right Ascension
Declination
Observation Duration
Volume ID
Primary File Spec
Surface Geometry
Ring Geometry Constraints
Wavelength Constraints
Start Over
Planet
Venus 272
Earth 66
Mars 272
Jupiter 107895
Saturn 1116759
Uranus 8842
Neptune 11069
Pluto 7359
Intended Target Name
+ Venus
+ Mars
+ Jupiter
+ Saturn
+ Uranus
+ Neptune
+ Pluto
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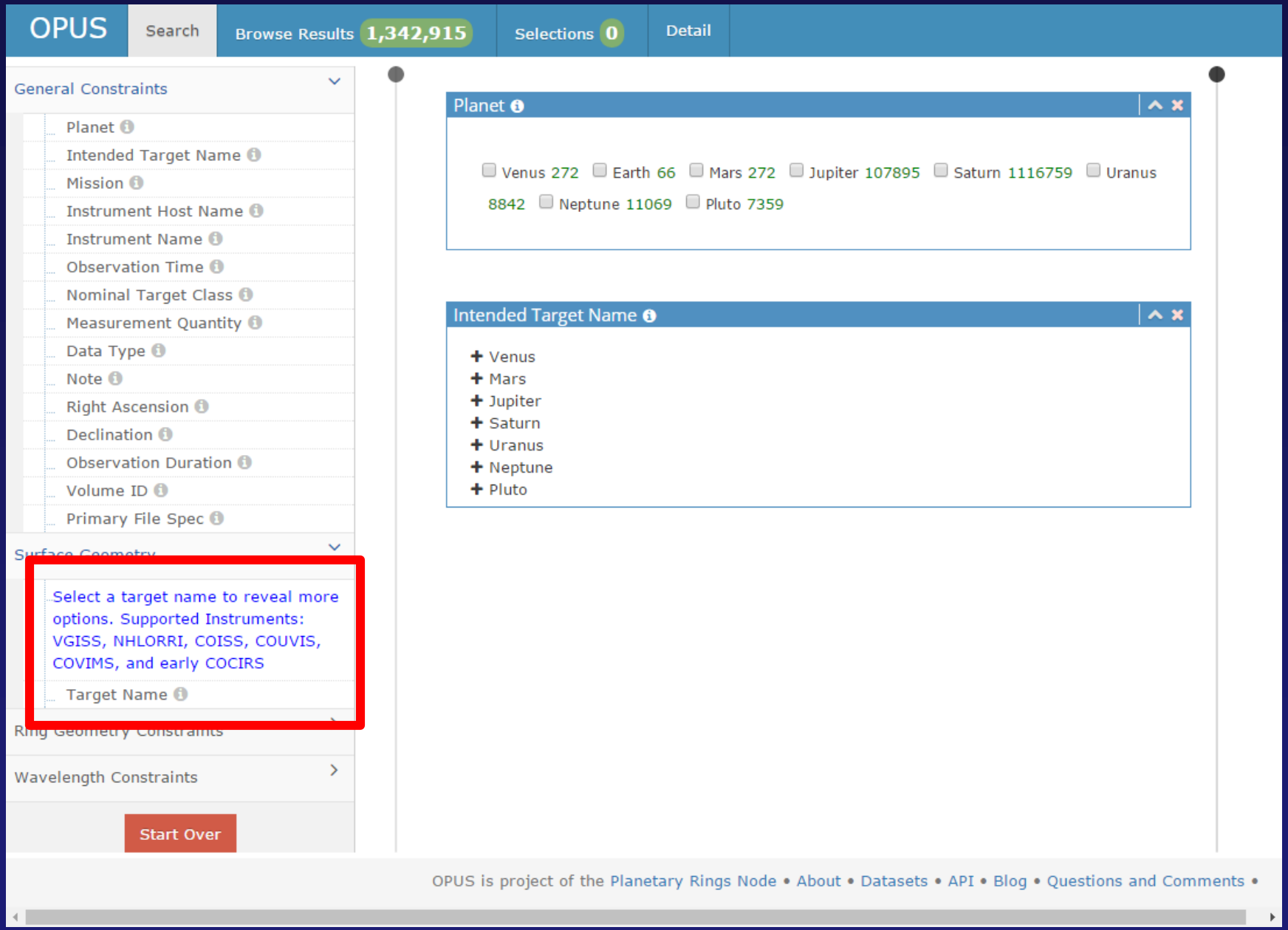
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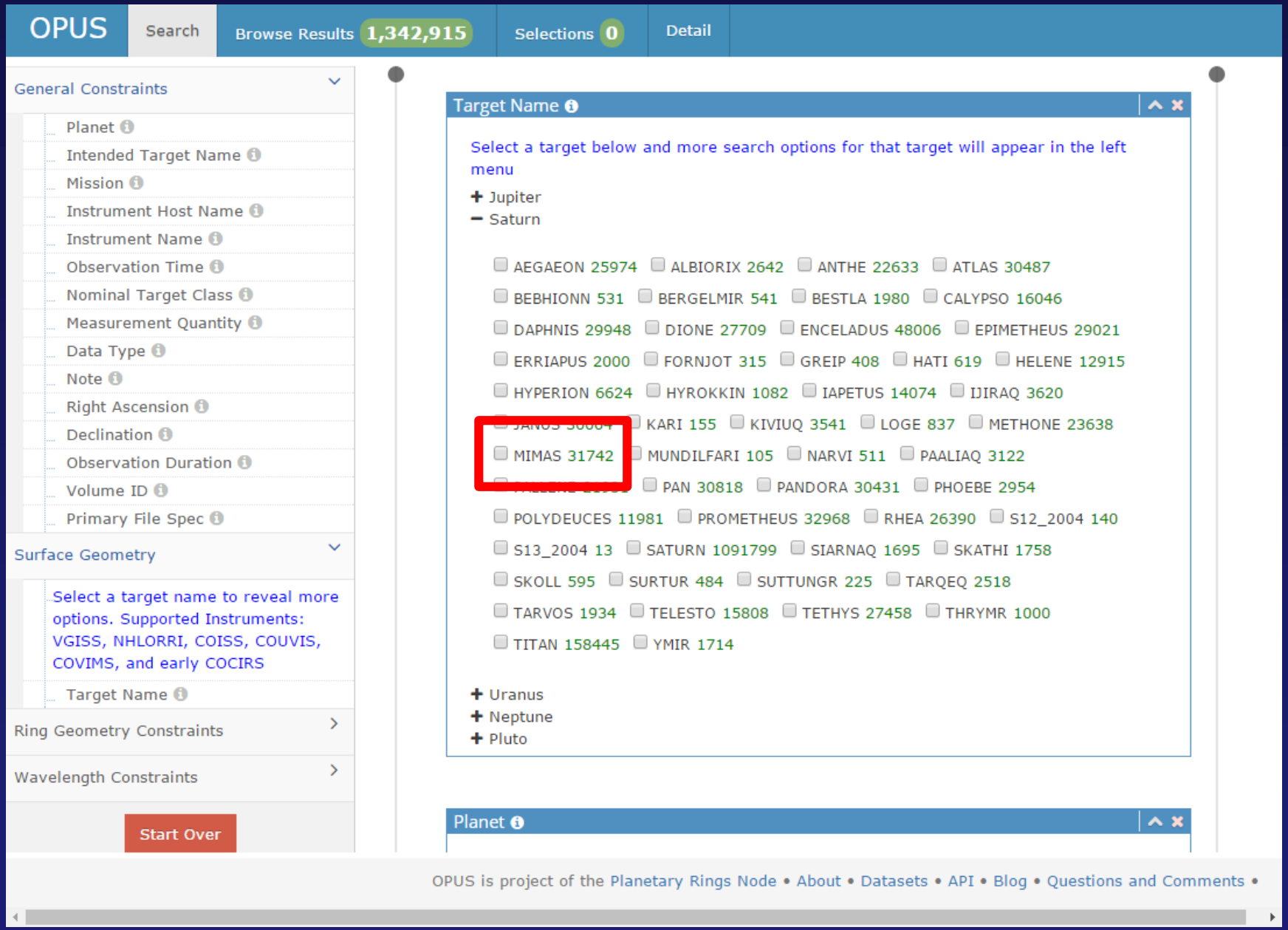
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Target Name
Ring Geometry Constraints
Wavelength Constraints
Start Over
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 25974
ALBIORIX 2642
ANTHE 22633
ATLAS 30487
BEBHIONN 531
BERGELMIR 541
BESTLA 1980
CALYPSO 16046
DAPHNIS 29948
DIONE 27709
ENCELADUS 48006
EPIMETHEUS 29021
ERRIAPUS 2000
FORNJOT 315
GREIP 408
HATI 619
HELENE 12915
HYPERION 6624
HYROKKIN 1082
IAPETUS 14074
IJIRAQ 3620
KARI 155
KIVIUQ 3541
LOGE 837
METHONE 23638
MIMAS 31742
MUNDILFARI 105
NARVI 511
PAALIAQ 3122
PAN 30818
PANDORA 30431
PHOEBE 2954
POLYDEUCES 11981
PROMETHEUS 32968
RHEA 26390
S12_2004 140
S13_2004 13
SATURN 1091799
SIARNAQ 1695
SKATHI 1758
SKOLL 595
SURTUR 484
SUTTUNGR 225
TARQEQ 2518
TARVOS 1934
TELESTO 15808
TETHYS 27458
THRYMR 1000
TITAN 158445
YMIR 1714
+ Uranus
+ Neptune
+ Pluto
Planet
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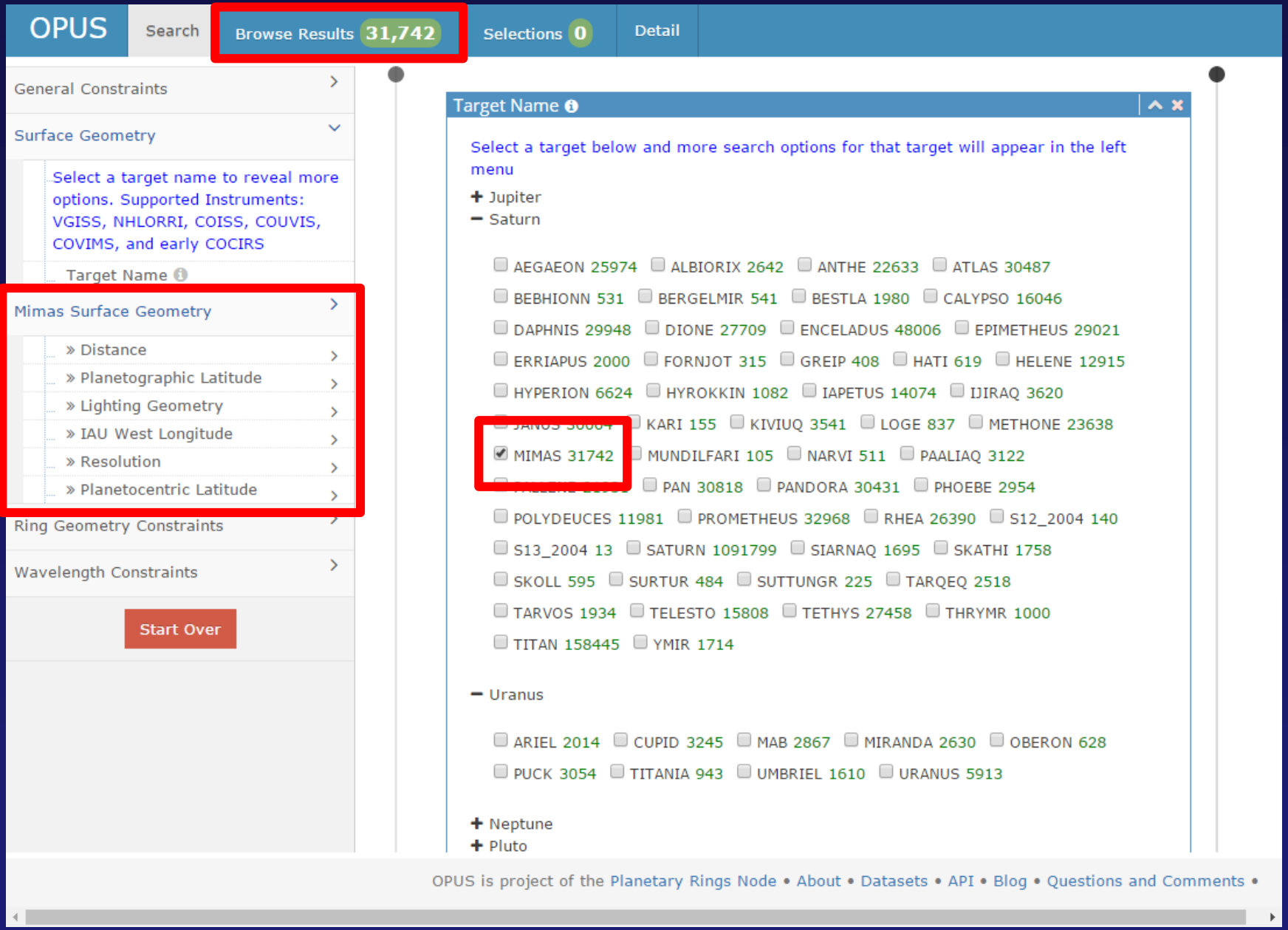
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Search
Browse Results 31,742
Selections 0
Detail
General Constraints
Surface Geometry
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Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
» Resolution
» Planetocentric Latitude
Ring Geometry Constraints
Wavelength Constraints
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TITAN 158445
YMIR 1714
− Uranus
ARIEL 2014
CUPID 3245
MAB 2867
MIRANDA 2630
OBERON 628
PUCK 3054
TITANIA 943
UMBRIEL 1610
URANUS 5913
+ Neptune
+ Pluto
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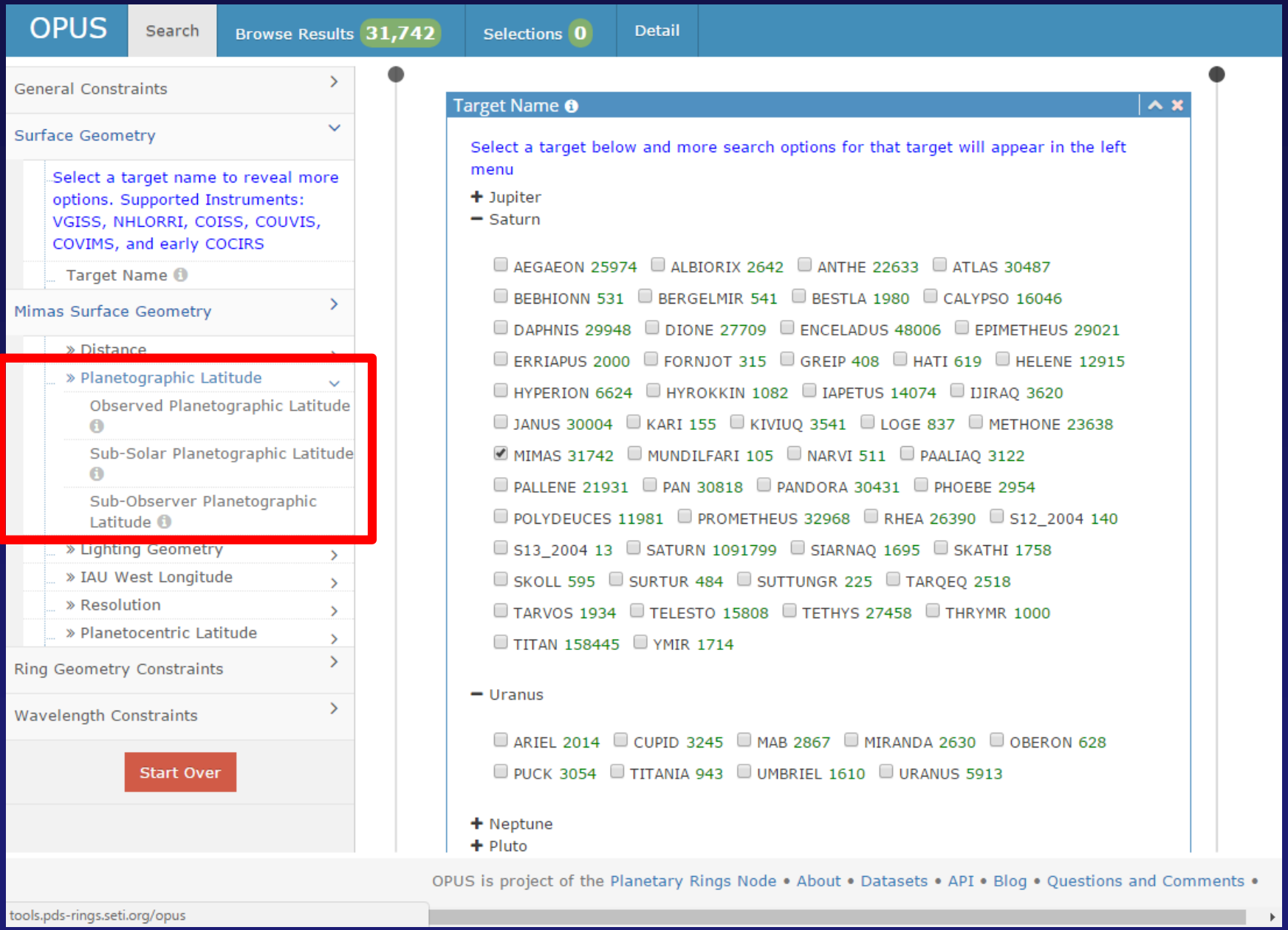
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Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
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ERRIAPUS 2000 FORNJOT 315 GREIP 408 HATI 619 HELENE 12915
HYPERION 6624 HYROKKIN 1082 IAPETUS 14074 IJIRAQ 3620
JANUS 30004 KARI 155 KIVIUQ 3541 LOGE 837 METHONE 23638
MIMAS 31742 MUNDILFARI 105 NARVI 511 PAALIAQ 3122
PALLENE 21931 PAN 30818 PANDORA 30431 PHOEBE 2954
POLYDEUCES 11981 PROMETHEUS 32968 RHEA 26390 S12_2004 140
S13_2004 13 SATURN 1091799 SIARNAQ 1695 SKATHI 1758
SKOLL 595 SURTUR 484 SUTTUNGR 225 TARQEQ 2518
TARVOS 1934 TELESTO 15808 TETHYS 27458 THRYMR 1000
TITAN 158445 YMIR 1714
− Uranus
ARIEL 2014 CUPID 3245 MAB 2867 MIRANDA 2630 OBERON 628
PUCK 3054 TITANIA 943 UMBRIEL 1610 URANUS 5913
+ Neptune
+ Pluto
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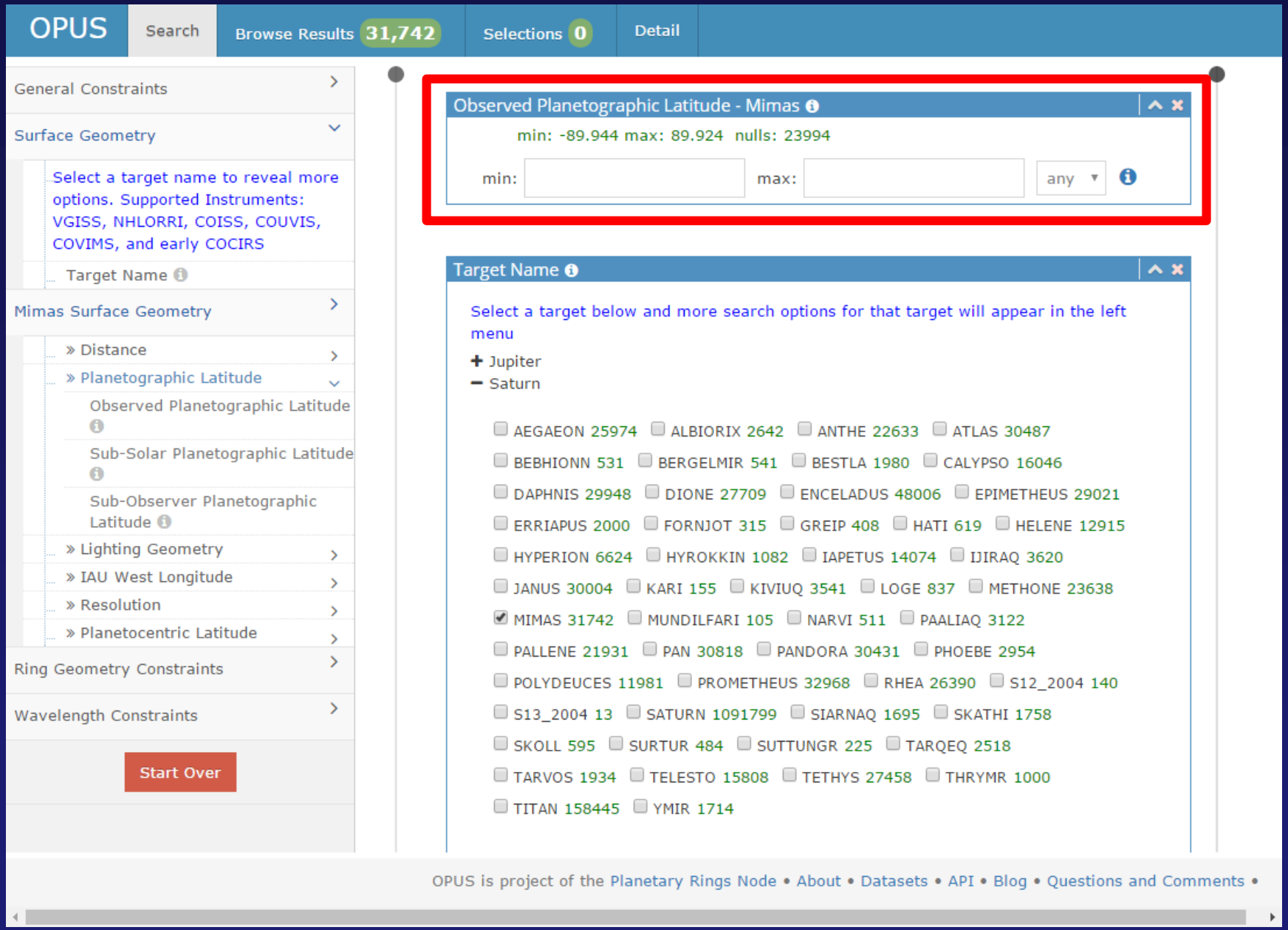
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» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
» Resolution
» Planetocentric Latitude
Ring Geometry Constraints
Wavelength Constraints
Start Over
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 23994
min:
max:
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 25974 ALBIORIX 2642 ANTHE 22633 ATLAS 30487
BEBHIONN 531 BERGELMIR 541 BESTLA 1980 CALYPSO 16046
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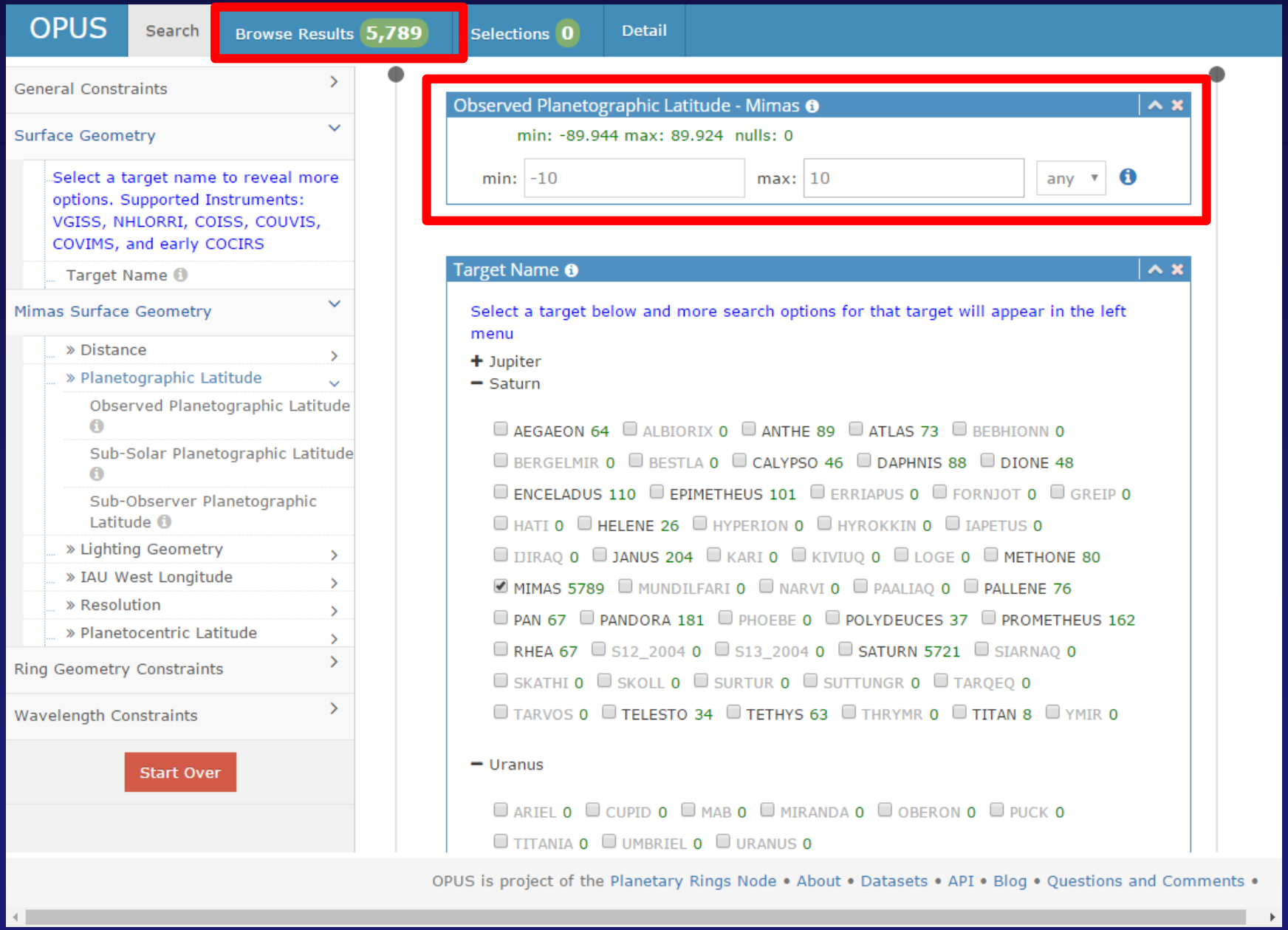
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Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
» Resolution
» Planetocentric Latitude
Ring Geometry Constraints
Wavelength Constraints
Start Over
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 64 ALBIORIX 0 ANTHE 89 ATLAS 73 BEBHIONN 0
BERGELMIR 0 BESTLA 0 CALYPSO 46 DAPHNIS 88 DIONE 48
ENCELADUS 110 EPIMETHEUS 101 ERRIAPUS 0 FORNJOT 0 GREIP 0
HATI 0 HELENE 26 HYPERION 0 HYROKKIN 0 IAPETUS 0
IJIRAQ 0 JANUS 204 KARI 0 KIVIUQ 0 LOGE 0 METHONE 80
MIMAS 5789 MUNDILFARI 0 NARVI 0 PAALIAQ 0 PALLENE 76
PAN 67 PANDORA 181 PHOEBE 0 POLYDEUCES 37 PROMETHEUS 162
RHEA 67 S12_2004 0 S13_2004 0 SATURN 5721 SIARNAQ 0
SKATHI 0 SKOLL 0 SURTUR 0 SUTTUNGR 0 TARQEQ 0
TARVOS 0 TELESTO 34 TETHYS 63 THRYMR 0 TITAN 8 YMIR 0
− Uranus
ARIEL 0 CUPID 0 MAB 0 MIRANDA 0 OBERON 0 PUCK 0
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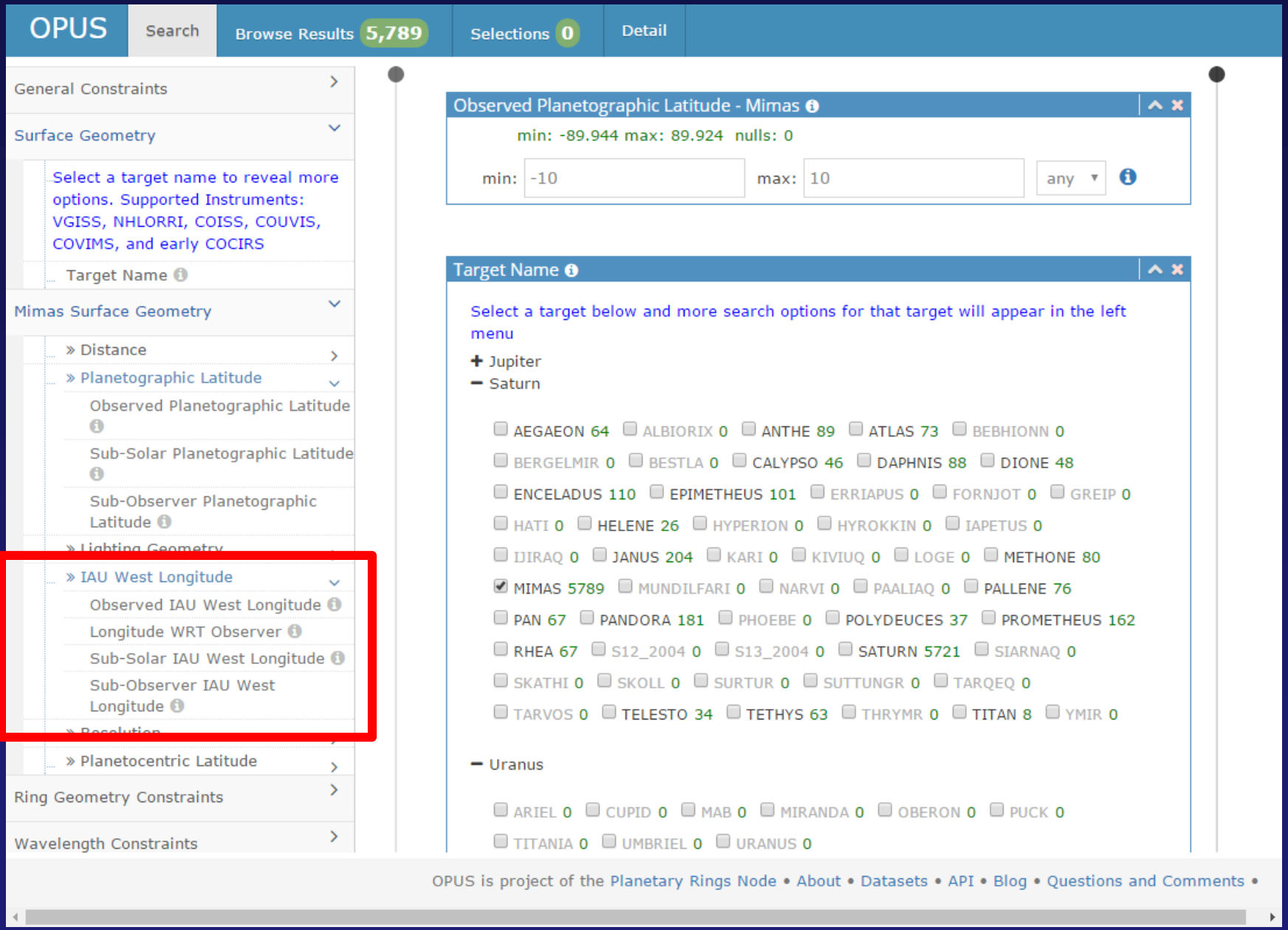
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» IAU West Longitude
Observed IAU West Longitude
Longitude WRT Observer
Sub-Solar IAU West Longitude
Sub-Observer IAU West Longitude
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Observed Planetographic Latitude - Mimas
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min: -10
max: 10
any
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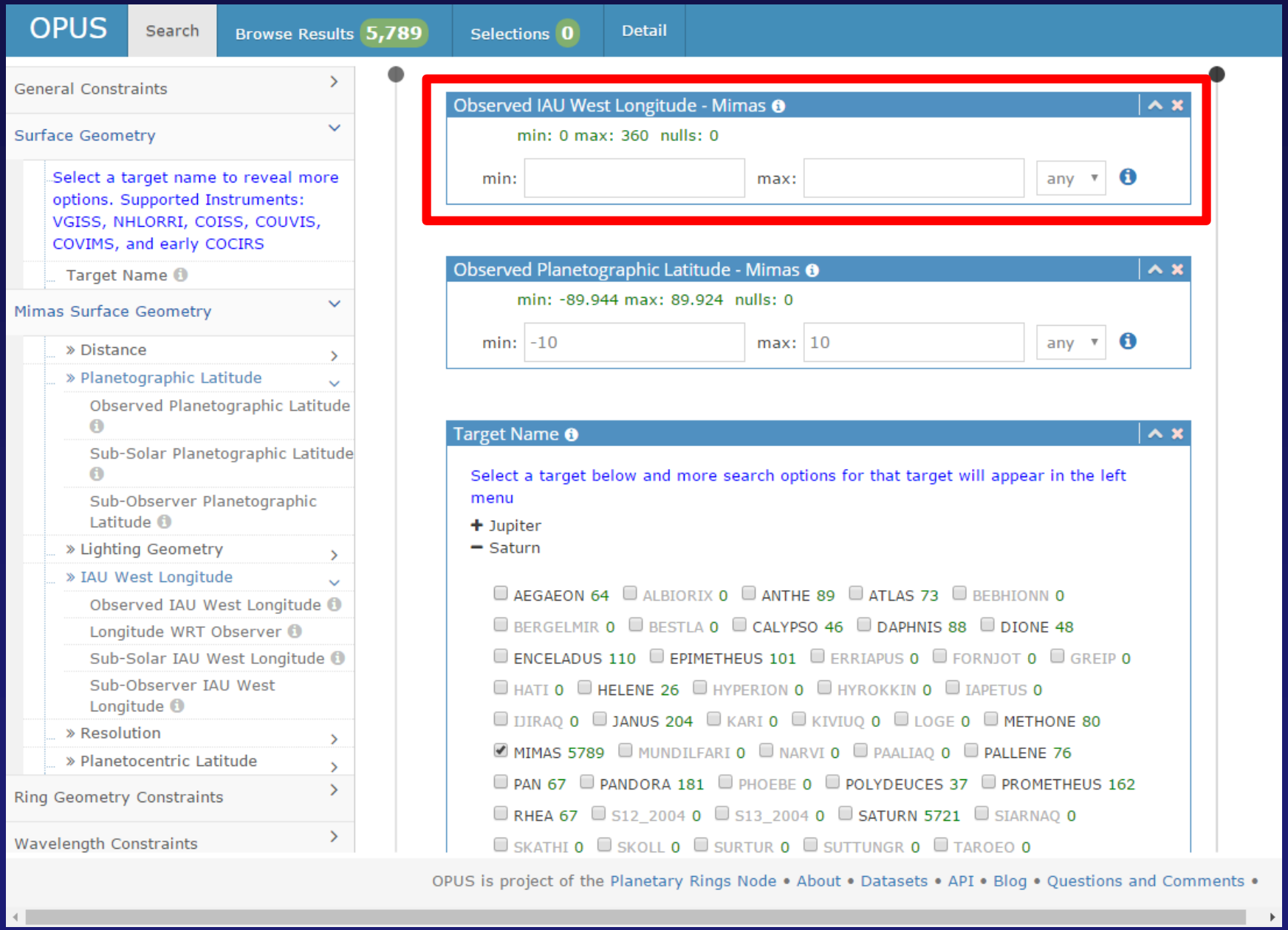
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Sub-Observer IAU West Longitude
» Resolution
» Planetocentric Latitude
Ring Geometry Constraints
Wavelength Constraints
Observed IAU West Longitude - Mimas
min: 0 max: 360 nulls: 0
min:
max:
any
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
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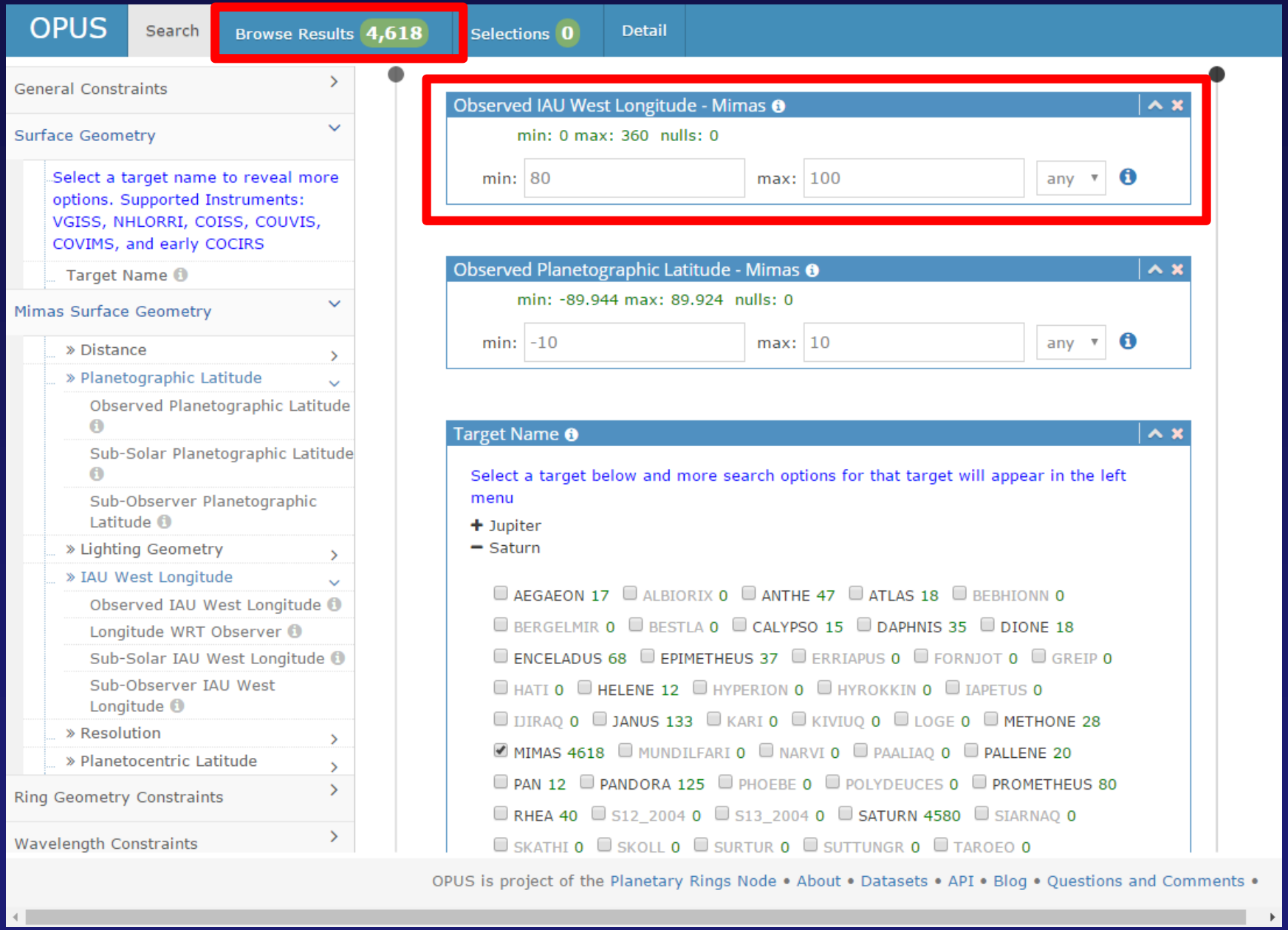
OPUS
Search
Browse Results 4,618
Selections 0
Detail
General Constraints
Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
Observed IAU West Longitude
Longitude WRT Observer
Sub-Solar IAU West Longitude
Sub-Observer IAU West Longitude
» Resolution
» Planetocentric Latitude
Ring Geometry Constraints
Wavelength Constraints
Observed IAU West Longitude - Mimas
min: 0 max: 360 nulls: 0
min: 80
max: 100
any
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 17 ALBIORIX 0 ANTHE 47 ATLAS 18 BEBHIONN 0
BERGELMIR 0 BESTLA 0 CALYPSO 15 DAPHNIS 35 DIONE 18
ENCELADUS 68 EPIMETHEUS 37 ERRIAPUS 0 FORNJOT 0 GREIP 0
HATI 0 HELENE 12 HYPERION 0 HYROKKIN 0 IAPETUS 0
IJIRAQ 0 JANUS 133 KARI 0 KIVIUQ 0 LOGE 0 METHONE 28
MIMAS 4618 MUNDILFARI 0 NARVI 0 PAALIAQ 0 PALLENE 20
PAN 12 PANDORA 125 PHOEBE 0 POLYDEUCES 0 PROMETHEUS 80
RHEA 40 S12_2004 0 S13_2004 0 SATURN 4580 SIARNAQ 0
SKATHI 0 SKOLL 0 SURTUR 0 SUTTUNGR 0 TAROEO 0
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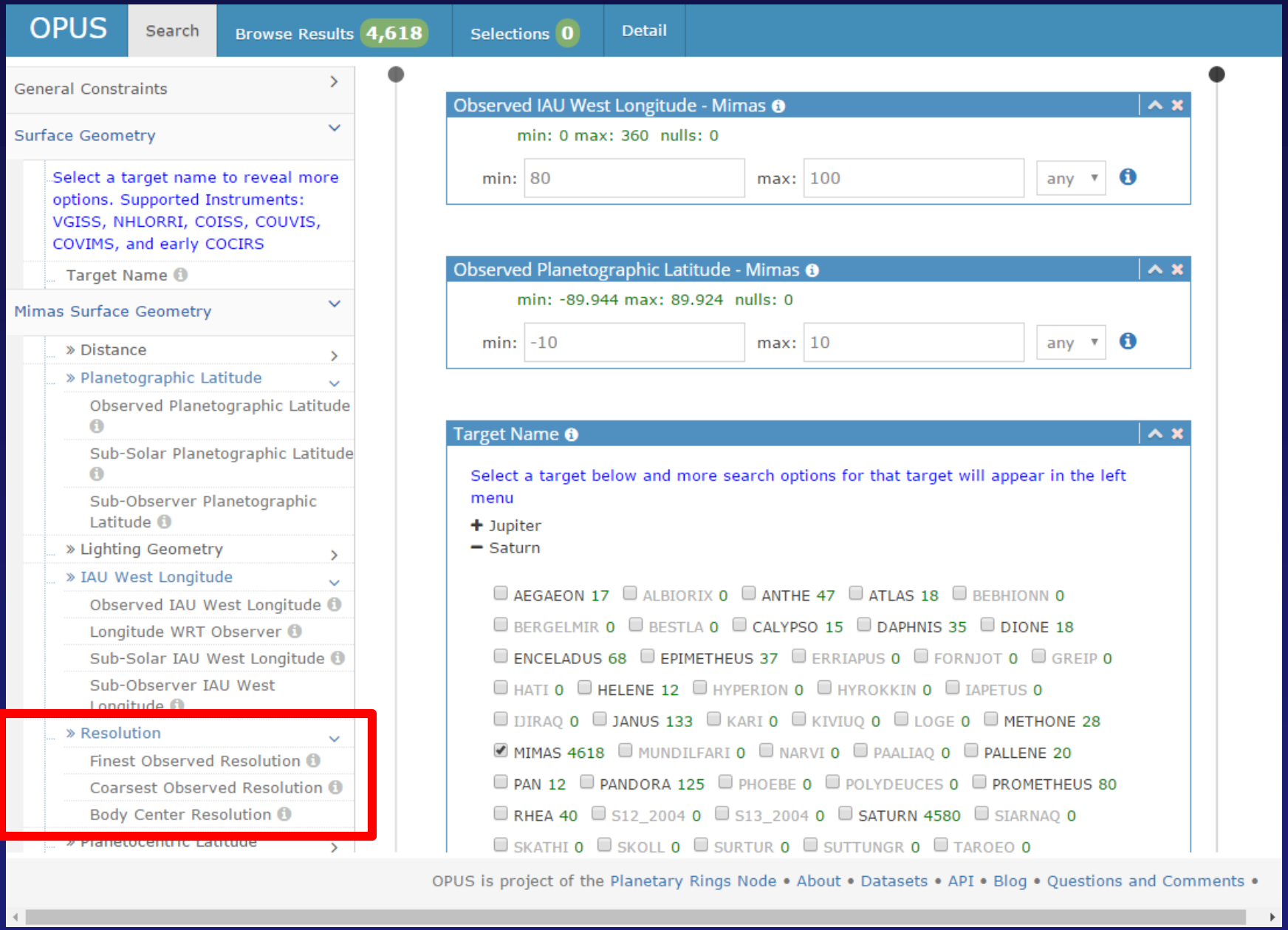
OPUS
Search
Browse Results 4,618
Selections 0
Detail
General Constraints
Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
Observed IAU West Longitude
Longitude WRT Observer
Sub-Solar IAU West Longitude
Sub-Observer IAU West Longitude
» Resolution
Finest Observed Resolution
Coarsest Observed Resolution
Body Center Resolution
» Planetocentric Latitude
Observed IAU West Longitude - Mimas
min: 0 max: 360 nulls: 0
min: 80
max: 100
any
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 17 ALBIORIX 0 ANTHE 47 ATLAS 18 BEBHIONN 0
BERGELMIR 0 BESTLA 0 CALYPSO 15 DAPHNIS 35 DIONE 18
ENCELADUS 68 EPIMETHEUS 37 ERRIAPUS 0 FORNJOT 0 GREIP 0
HATI 0 HELENE 12 HYPERION 0 HYROKKIN 0 IAPETUS 0
IJIRAQ 0 JANUS 133 KARI 0 KIVIUQ 0 LOGE 0 METHONE 28
MIMAS 4618 MUNDILFARI 0 NARVI 0 PAALIAQ 0 PALLENE 20
PAN 12 PANDORA 125 PHOEBE 0 POLYDEUCES 0 PROMETHEUS 80
RHEA 40 S12_2004 0 S13_2004 0 SATURN 4580 SIARNAQ 0
SKATHI 0 SKOLL 0 SURTUR 0 SUTTUNGR 0 TAROEO 0
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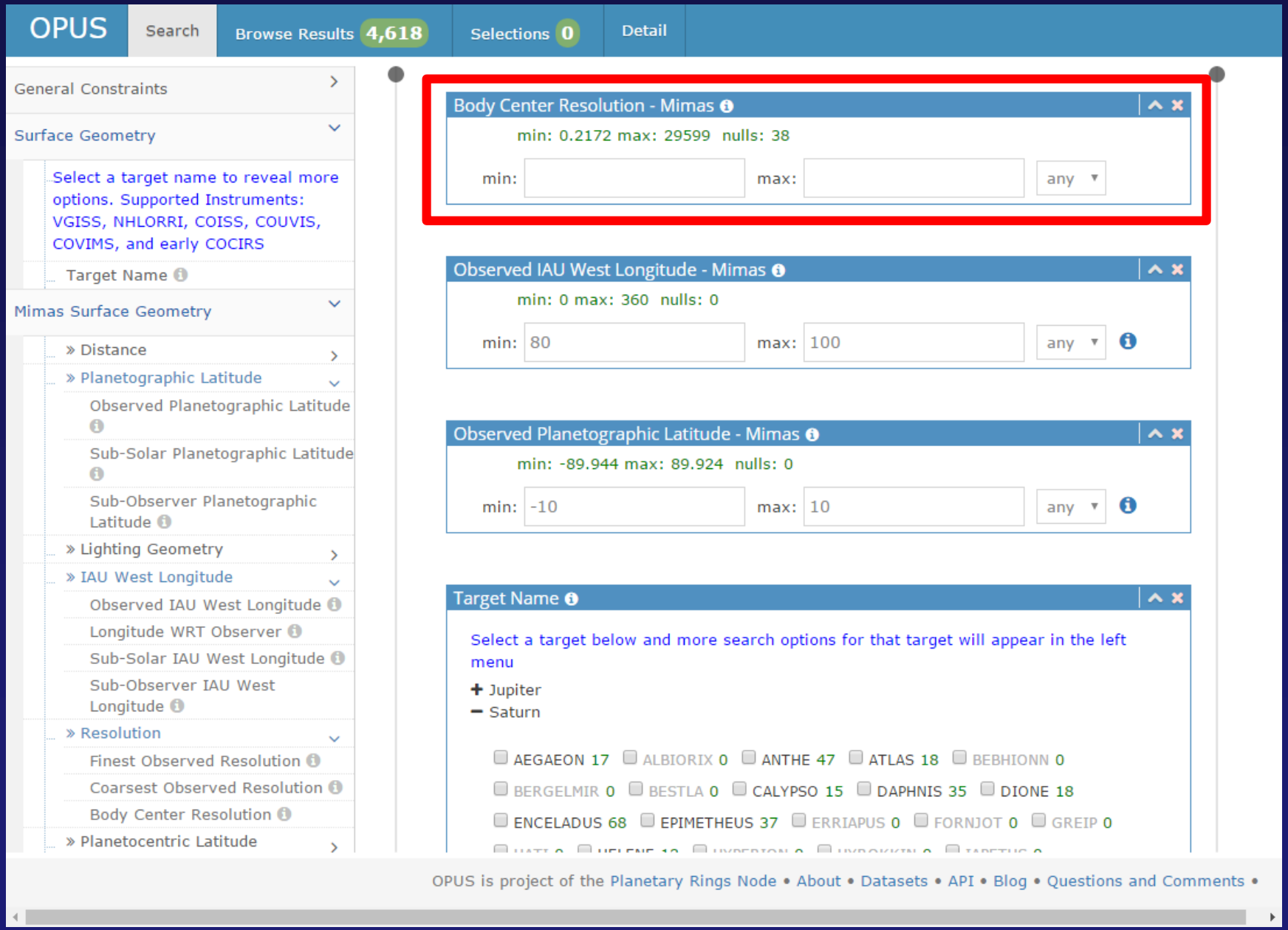
OPUS
Search
Browse Results 4,618
Selections 0
Detail
General Constraints
Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
Observed IAU West Longitude
Longitude WRT Observer
Sub-Solar IAU West Longitude
Sub-Observer IAU West Longitude
» Resolution
Finest Observed Resolution
Coarsest Observed Resolution
Body Center Resolution
» Planetocentric Latitude
Body Center Resolution - Mimas
min: 0.2172 max: 29599 nulls: 38
min:
max:
any
Observed IAU West Longitude - Mimas
min: 0 max: 360 nulls: 0
min: 80
max: 100
any
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 17
ALBIORIX 0
ANTHE 47
ATLAS 18
BEBHIONN 0
BERGELMIR 0
BESTLA 0
CALYPSO 15
DAPHNIS 35
DIONE 18
ENCELADUS 68
EPIMETHEUS 37
ERRIAPUS 0
FORNJOT 0
GREIP 0
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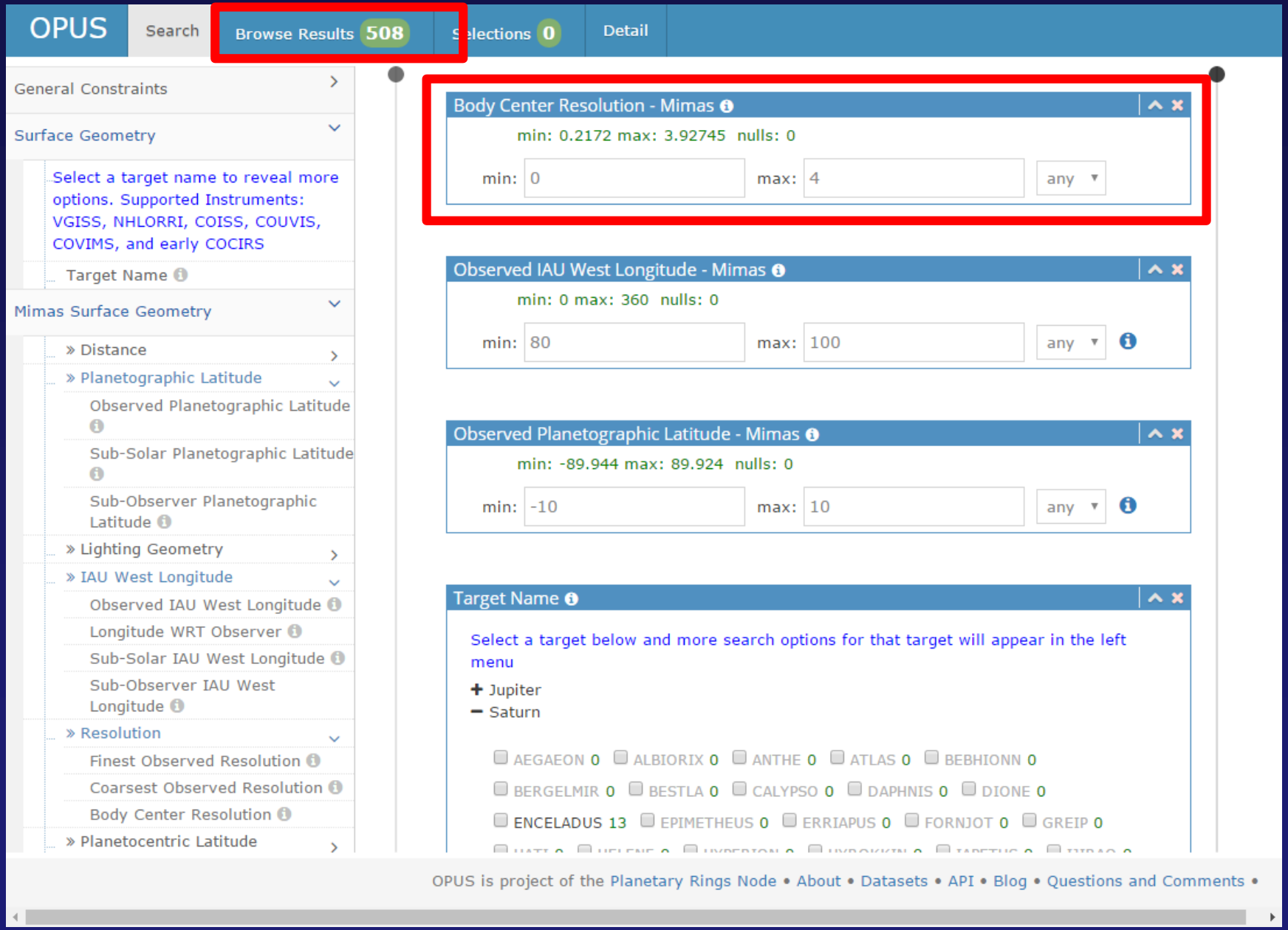
OPUS
Search
Browse Results 508
Selections 0
Detail
General Constraints
Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Sub-Solar Planetographic Latitude
Sub-Observer Planetographic Latitude
» Lighting Geometry
» IAU West Longitude
Observed IAU West Longitude
Longitude WRT Observer
Sub-Solar IAU West Longitude
Sub-Observer IAU West Longitude
» Resolution
Finest Observed Resolution
Coarsest Observed Resolution
Body Center Resolution
» Planetocentric Latitude
Body Center Resolution - Mimas
min: 0.2172 max: 3.92745 nulls: 0
min: 0
max: 4
any
Observed IAU West Longitude - Mimas
min: 0 max: 360 nulls: 0
min: 80
max: 100
any
Observed Planetographic Latitude - Mimas
min: -89.944 max: 89.924 nulls: 0
min: -10
max: 10
any
Target Name
Select a target below and more search options for that target will appear in the left menu
+ Jupiter
− Saturn
AEGAEON 0
ALBIORIX 0
ANTHE 0
ATLAS 0
BEBHIONN 0
BERGELMIR 0
BESTLA 0
CALYPSO 0
DAPHNIS 0
DIONE 0
ENCELADUS 13
EPIMETHEUS 0
ERRIAPUS 0
FORNJOT 0
GREIP 0
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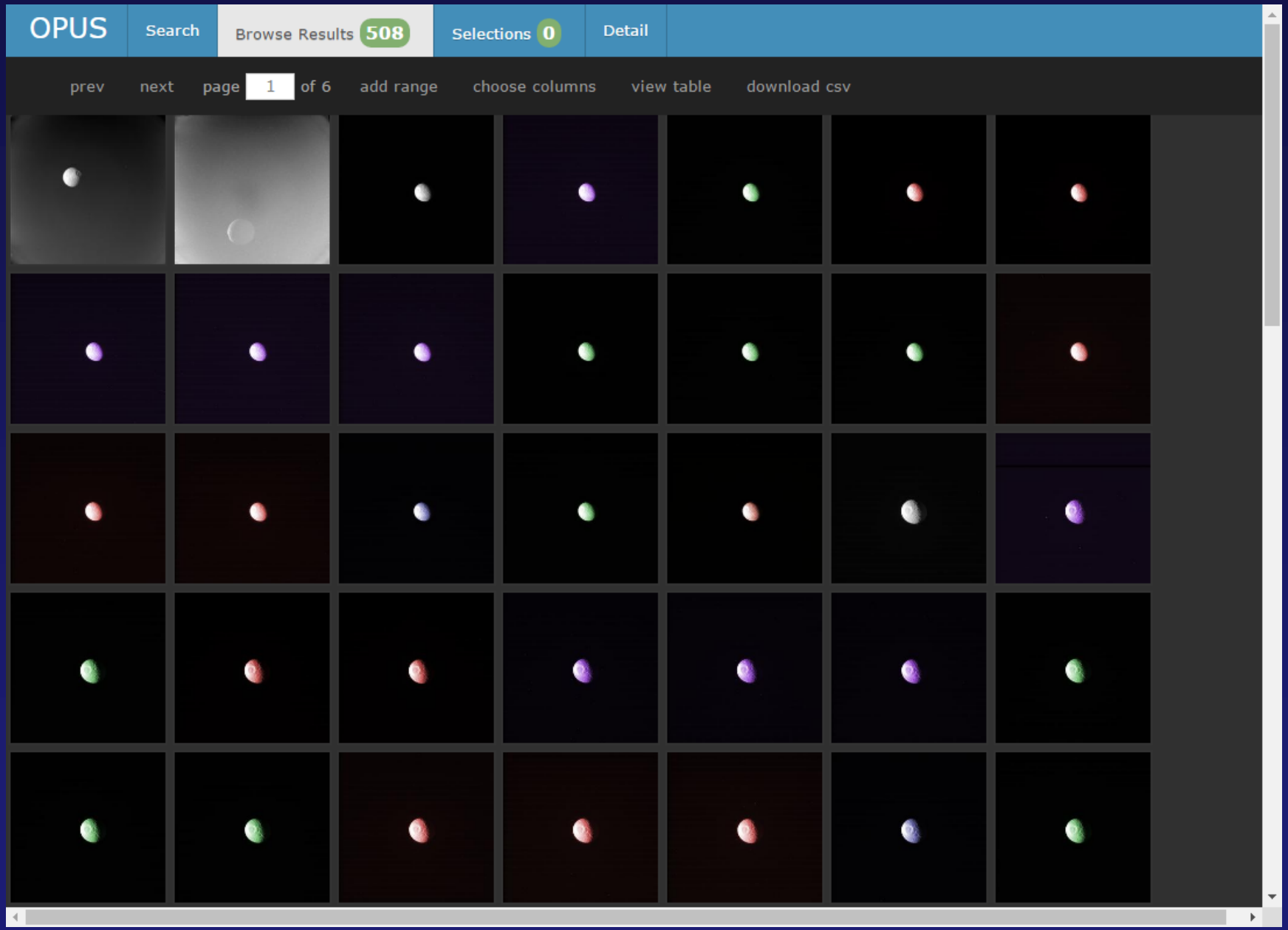

OPUS
Search
Browse Results 508
Selections 0
Detail
prev
next
page 1 of 6
add range
choose columns
view table
download csv

OPUS | Search | Browse Results 508 | Selections 0 | Detail

prev next page 1 of 6 add range choose columns view table download csv

Ring Observation ID:
S_IMG_VG1_ISS_3493350_N

Planet:
SAT

Intended Target Name:
MIMAS

Observed Phase Angle:
42.181

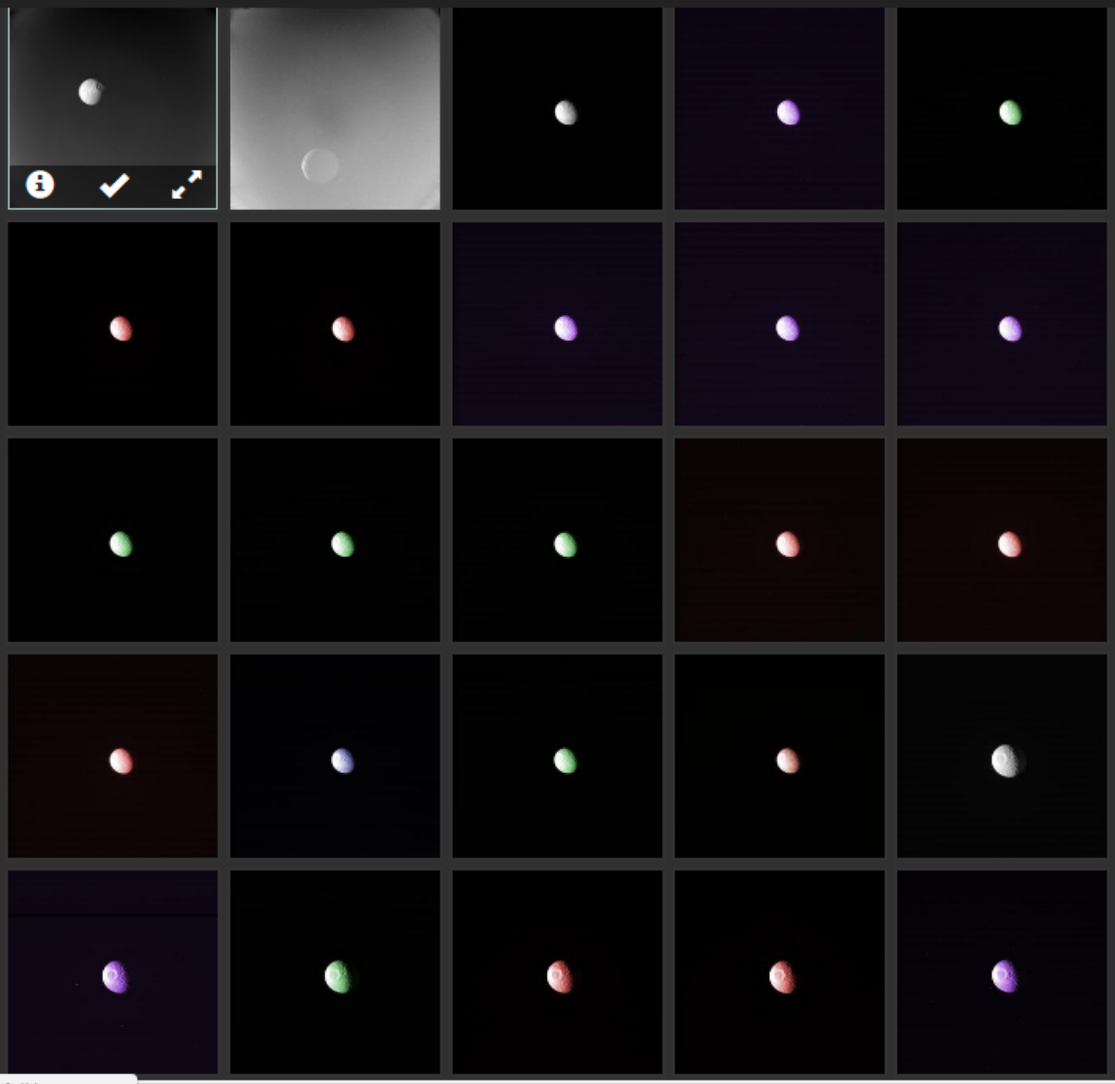
Observed Phase Angle 2:
42.678

Observation Time 1 (UTC):
1980-11-12T15:37:22

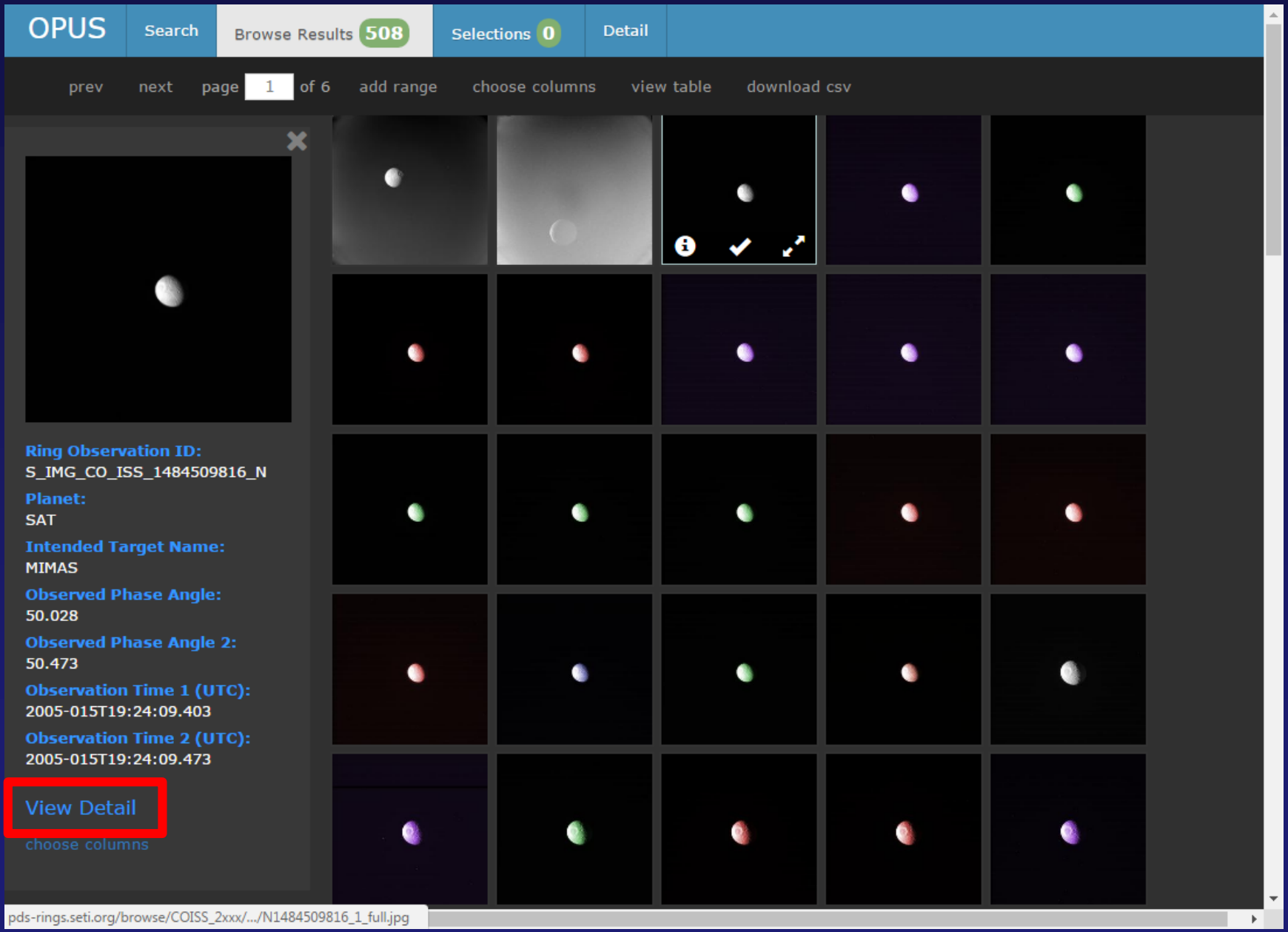
Observation Time 2 (UTC):
1980-11-12T15:37:22

View Detail

choose columns



pds-rings.seti.org/browse/VGISS_6xxx/.../C3493350_full.jpg


OPUS
Search
Browse Results 508
Selections 0
Detail
prev
next
page 1 of 6
add range
choose columns
view table
download csv
Ring Observation ID:
S_IMG_CO_ISS_1484509816_N
Planet:
SAT
Intended Target Name:
MIMAS
Observed Phase Angle:
50.028
Observed Phase Angle 2:
50.473
Observation Time 1 (UTC):
2005-015T19:24:09.403
Observation Time 2 (UTC):
2005-015T19:24:09.473
View Detail
choose columns
pds-rings.seti.org/browse/COISS_2xxx/.../N1484509816_1_full.jpg

OPUS | Search | Browse Results 508 | Selections 0 | Detail

Ring Observation Detail

Ring Observation ID: S_IMG_CO_ISS_1484509816_N

PDS Products:

RAW_IMAGE: LBL IMG FMT FMT

CALIBRATED: LBL IMG FMT FMT

preview_image: jpg jpg jpg jpg

Rings Node Supplemental Products:

Preview Images (jpeg/png): Full Resolution Medium Small Thumb

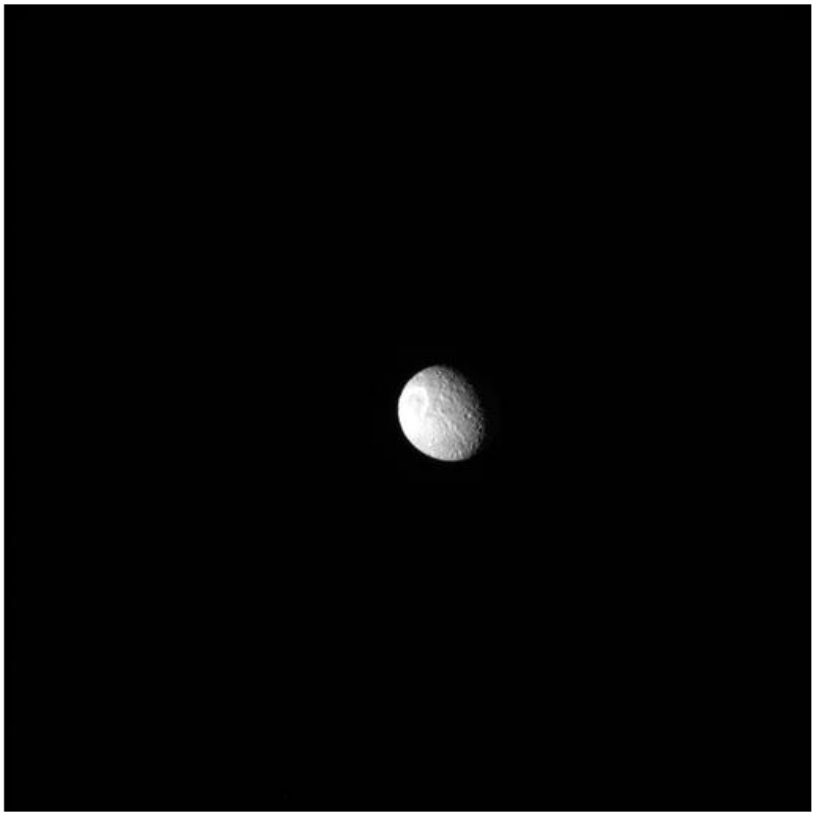
- phase1: 50.028
- phase2: 50.473
- target_name: MIMAS
- ring_obs_id: S_IMG_CO_ISS_1484509816_N
- time1: 2005-015T19:24:09.403
- time2: 2005-015T19:24:09.473
- planet_id: SAT

All Metadata for this Observation:

Grab all metadata as json

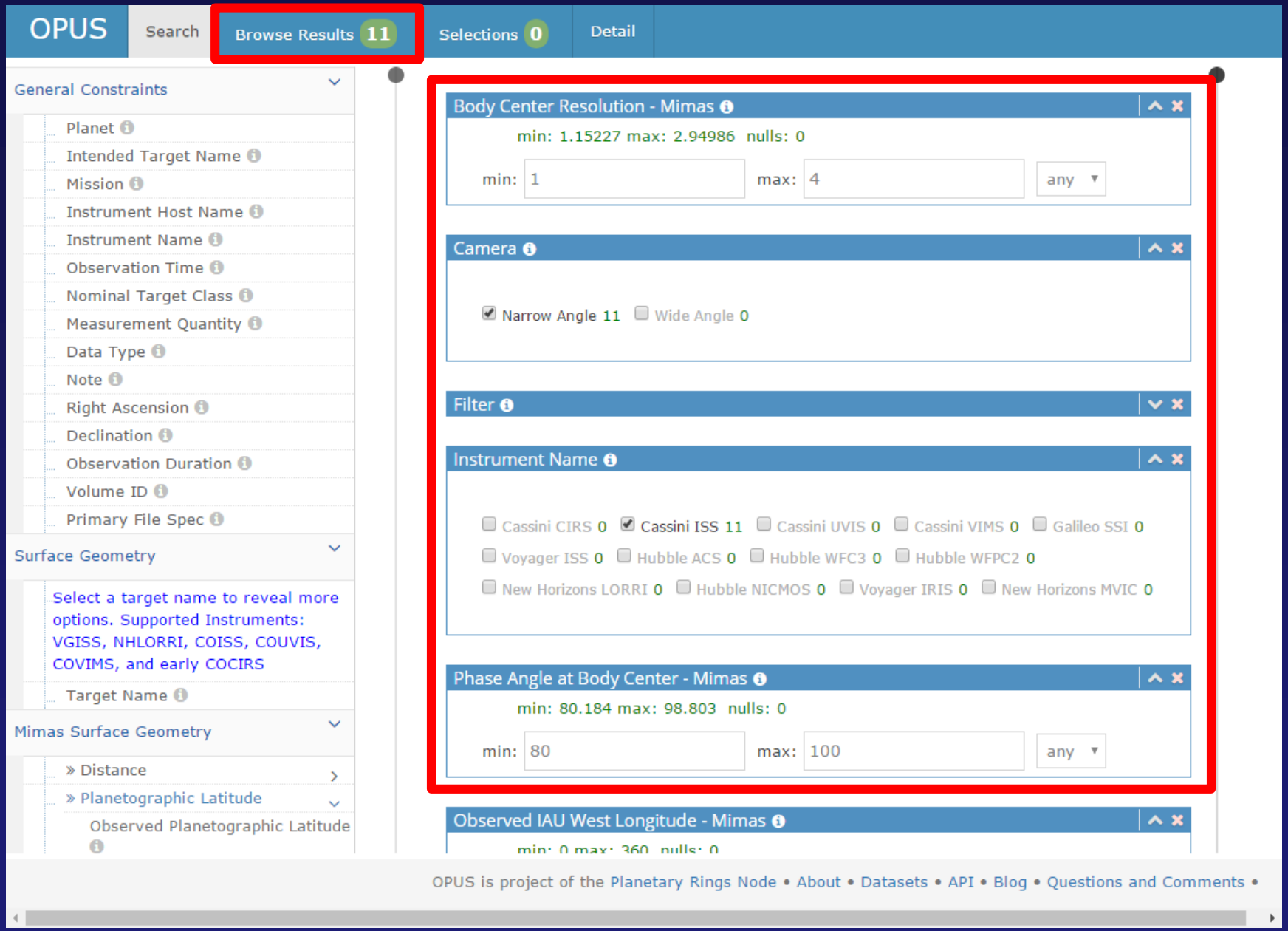
General Constraints

- is_image: 1
- planet_id: SAT
- target_name: MIMAS
- mission_id: CO
- inst_host_id: CO
- instrument_id: COISS



Mimas Surface Geometry

- Observer_longitude: 9.9555
- d_Observer_longitude: 77.3565
- solar_hour_angle: 216.304
- d_solar_hour_angle: 83.358
- IAU_west_longitude: 75.945
- d_IAU_west_longitude: 77.357
- planetocentric_latitude1: -76.758
- planetocentric_latitude2: 56.897
- sub_solar_planetocentric_latitude: -23.447
- sub_observer_planetocentric_latitude: 2.288
- planetographic_latitude1: -78.759
- planetographic_latitude2: 61.162
- sub_solar_planetographic_latitude: -25.069
- sub_observer_planetographic_latitude: 2.478
- IAU_west_longitude1: 358.588
- IAU_west_longitude2: 153.302
- Observer_longitude2: 87.312
- Observer_longitude1: -67.401
- sub_solar_IAU_longitude: 110.334
- sub_observer_IAU_longitude: 65.99
- finest_resolution1: 3.14813
- finest_resolution2: 3.14925
- coarsest_resolution1: 3.14935
- coarsest_resolution2: 32.70582
- center_resolution: 3.14932
- solar_hour_angle1: 132.946
- solar_hour_angle2: 299.662
- phase1: 50.21
- phase2: 50.252
- center_phase_angle: 50.231
- incidence1: 2.92
- incidence2: 126.458
- emission1: 1.591
- emission2: 87.594
- range_to_body1: 527723.027
- range_to_body2: 527916.55
- center_distance: 527921.541


OPUS
Search
Browse Results 11
Selections 0
Detail
General Constraints
Planet
Intended Target Name
Mission
Instrument Host Name
Instrument Name
Observation Time
Nominal Target Class
Measurement Quantity
Data Type
Note
Right Ascension
Declination
Observation Duration
Volume ID
Primary File Spec
Surface Geometry
Select a target name to reveal more options. Supported Instruments: VGISS, NHLORRI, COISS, COUVIS, COVIMS, and early COCIRS
Target Name
Mimas Surface Geometry
» Distance
» Planetographic Latitude
Observed Planetographic Latitude
Body Center Resolution - Mimas
min: 1.15227 max: 2.94986 nulls: 0
min: 1
max: 4
any
Camera
Narrow Angle 11
Wide Angle 0
Filter
Instrument Name
Cassini CIRS 0
Cassini ISS 11
Cassini UVIS 0
Cassini VIMS 0
Galileo SSI 0
Voyager ISS 0
Hubble ACS 0
Hubble WFC3 0
Hubble WFPC2 0
New Horizons LORRI 0
Hubble NICMOS 0
Voyager IRIS 0
New Horizons MVIC 0
Phase Angle at Body Center - Mimas
min: 80.184 max: 98.803 nulls: 0
min: 80
max: 100
any
Observed IAU West Longitude - Mimas
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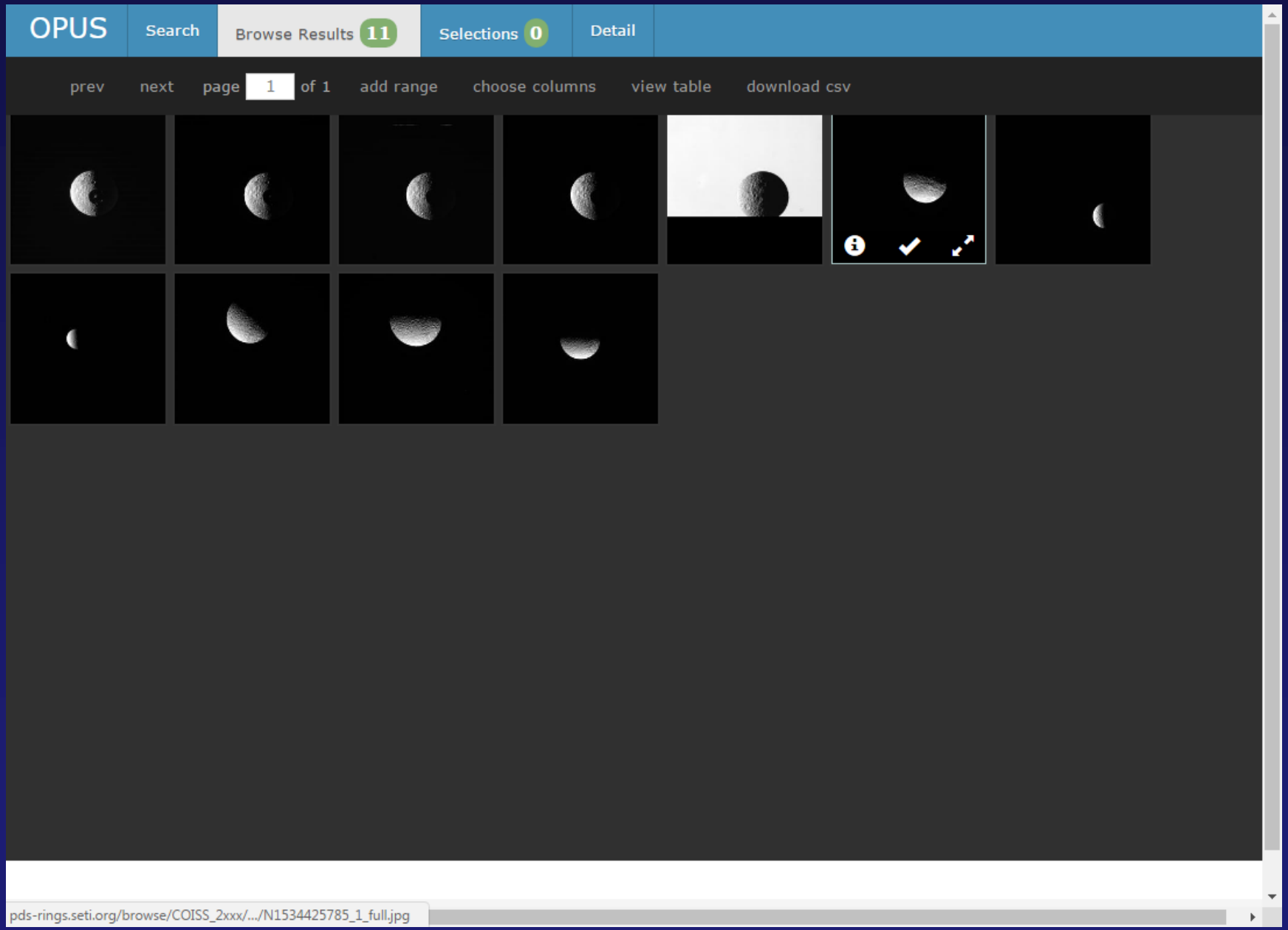
OPUS
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Browse Results 11
Selections 0
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choose columns
view table
download csv
pds-rings.seti.org/browse/COISS_2xxx/.../N1534425785_1_full.jpg

OPUS | Search | Browse Results 11 | Selections 11 | Detail

prev next page 1 of 1 add range choose columns view table download csv

OPUS | Search | Browse Results 11 | Selections 11 | Detail

Your Selections

Total Files: 60

Total Size (before zip): 0B

Download CSV

Download Zipped Archive

Options:

Product Types:

- [x] RAW_IMAGE 11
- [ ] FITS_HEADER_INFO
- [ ] FOOTPRINT_GEOMETRY
- [ ] CALIBRATED_IMAGE
- [ ] DECOMPRESSED_RAW_IMAGE
- [ ] RESEAU_TABLE
- [ ] COMPRESSED_RAW_IMAGE
- [x] CALIBRATED 11
- [ ] RAW_TIME_SERIES
- [ ] PACKETIZED_RAW_IMAGE
- [ ] RAW_SPECTRUM
- [ ] CALIBRATED_SPECTRUM_PREFIX
- [ ] TIEPOINT_TABLE
- [ ] TIFF_PREVIEW_IMAGE
- [ ] LOSSY_RAW_IMAGE
- [ ]

Support for Developers

- API for retrieving images and metadata

  `http://tools.pds-rings.seti.org/opus/api/`

- Python software for
  - VICAR files
  - Planetary gravity fields
  - PDS label parsing
  - And much more!

  `https://github.com/SETI/pds-tools`