The Outer Planets Unified Search (OPUS) Tool – Current Status and Future Plans. R. S. French[1], D. J. Stopp[1], Y.-J. Chang[1], M. S. Tiscareno[1], M. R. Showalter[1], and M. K. Gordon[1]. [1]SETI Institute, 189 Bernardo Ave, Suite 200, Mountain View, CA 94043, rfrench@seti.org

Introduction: Outer Planets Unified Search (OPUS) is a comprehensive search tool provided by the Ring-Moon Systems Node of NASA's Planetary Data System (PDS). Since its first release 12 years ago, OPUS has continued to become more user-friendly, support more complex searches, and include more data sets.

OPUS currently hosts 1.5 million images, spectra, and occultations from Cassini, Voyager 1 and 2, Galileo, New Horizons, and the Hubble Space Telescope. In addition to an intuitive web-based user interface that allows cross-mission and cross-instrument searches of the metadata provided by each instrument team, OPUS adds searchable metadata describing surface geometry and lighting of all planets and satellites in the field of view as well as ring plane geometry and lighting where applicable.

Recent Improvements: Over the past two years, OPUS has added a variety of new features and data sets, while simultaneously undergoing internal changes that will eventually allow the inclusion of data in the PDS4 format.

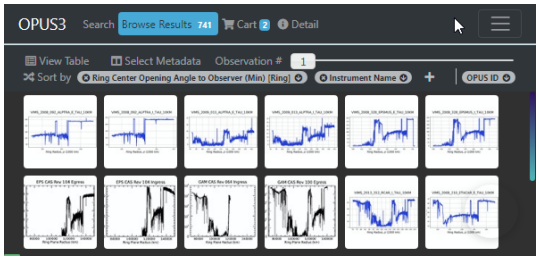
New data sets:

- Saturn ring occultation profiles from Cassini RSS, UVIS, and VIMS, as well as from a variety of ground-based telescopes. In addition to optical depth profiles at multiple resolutions, these observations include preview images, viewing geometry diagrams, and full documentation.
- Cassini ISS Saturn observations calibrated using the final version of CISSCAL.
- Updated data for Cassini UVIS.

New features:

- A complete redesign of the shopping cart, including the addition of a "recycle bin" allowing the restoration of removed observations, the ability to add all search results to the cart, and a full breakdown of what product types are available for download.
- The ability to sort on multiple fields simultaneously.
- Improvements to the "table view" and "slideshow", allowing the easy insertion and deletion of metadata fields.
- The addition of units to relevant metadata fields, with the ability to perform searches using other units (e.g. Saturn radii instead of km).
- The ability to search string fields using full regular expressions.
- The ability to search for multiple values for a single metadata field.
- A new "Multiple Target List" field that allows easy searching for observations containing multiple bodies.
- Preprogrammed ranges that make it easy to search on common values, such as the minimum and maximum radius of Saturn's A Ring.
- An interactive chat system that allows users to ask questions or give feedback in real time.
- Improved documentation, including a complete tutorial available on YouTube: https://tinyurl.com/opustutorial2020

Public API: In addition to the web-based interface, OPUS supports a public RESTful API that allows easy programmatic queries. We have written a new guide for the API which fully explains all of its features, and have also produced a video tutorial available on YouTube: https://tinyurl.com/opusapi2020



Download Options

Select which product types to include in downloads:

Select all product types | Deselect all product types

Product Type	# Obs	# Files	Size
Cassini RSS-Specific Products			
Occultation Profile (~1 km res)	1	2	50M
Occultation Profile (10 km res)	1	2	5M
Diffraction-Ltd Occultation Profile	1	2	50M
Occultation Calibration Parameters	1	2	537K
Occultation Geometry Parameters	1	2	3M
Occultation Documentation	1	10	4M
Earth-based Occultations-Specific Products			
Occultation Profile	1	2	339K
Geometry Table	1	2	7K
Preview Plot	1	3	928K
Geometry Diagram	1	3	40K
Source Data	1	4	220K