PDS Geosciences Node Orbital Data Explorers and Landed Mission Analyst's Notebooks

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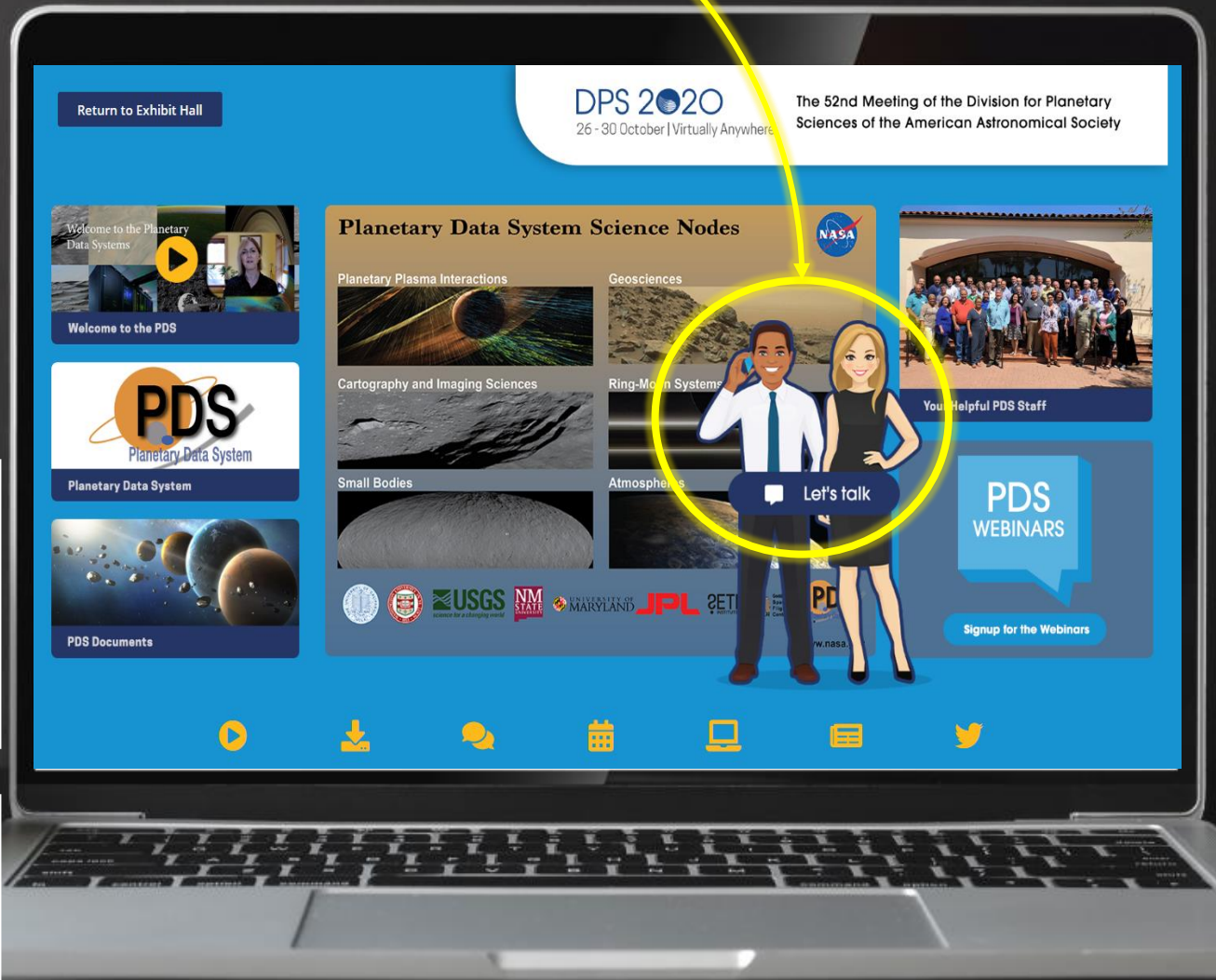
and the PDS Geosciences Team

52nd DPS Meeting
28 October 2020
2:00 – 2:30 pm EDT

https://pds-geosciences.wustl.edu

To enter a tutorial session, click on “Let’s talk” at the **PDS Exhibitor Booth** at the DPS web site.



Webinars

Introduction to PDS Geosciences Node Data Sets and Analysis Tools
Monday, October 26
12:00 to 12:30 PM EDT

Introduction to PDS Geosciences Node Orbital Data Explorers and Analyst Notebooks for Landed Missions
Wednesday, October 28
2:00 to 2:30 PM EDT

Tutorials

Use of MRO CRISM Hyperspectral Imaging Data
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Spirit, Opportunity, Curiosity Mars Rover Alpha Particle X-Ray Spectrometer Data Sets and Analysis Tools
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Using PDS Geosciences Node Analyst Notebooks
Thursday, October 29
3:00 to 4:00 PM EDT

What the Geosciences Node does

- The PDS Geosciences Node is located at Washington University in St. Louis, Missouri, in the Department of Earth and Planetary Sciences
- We archive planetary science data for the study of the surface and interior of the terrestrial planets and satellites (Mercury, Venus, Earth's Moon, and Mars)
- We help data providers put data into PDS by…
  - Working with missions to design, receive and validate data deliveries
  - Working with individual scientists to archive data from their research, e.g., from PDART-funded projects
- We help the planetary science community get data out of PDS by…
  - Providing services for searching and downloading data
  - Providing expert help in understanding and using the data

Geosciences Node data discovery and access tools

Orbital Data Explorer

https://ode.rsl.wustl.edu

Provides capability to search, display, and download products from orbital missions to Mercury, Venus, Earth's Moon, and Mars

Analyst's Notebook

https://an.rsl.wustl.edu

Provides integrated access to data, documentation, observation planning, and targets for data from landed missions on Mars and Earth's Moon

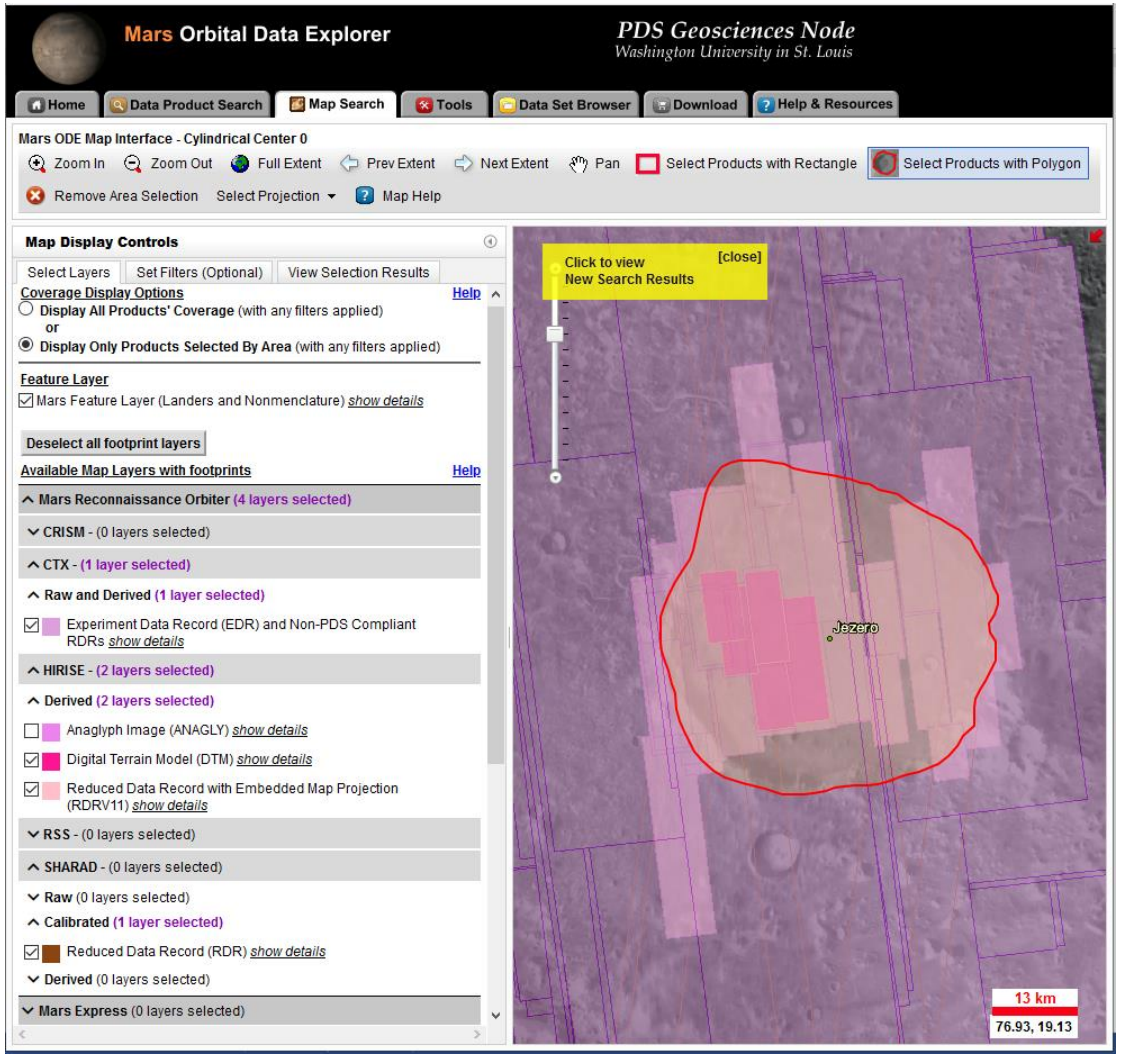
Orbital Data Explorer (ODE)

https://ode.rsl.wustl.edu

Orbital Data Explorer

https://ode.rsl.wustl.edu

- Provides capability to search, display, and download products from orbital missions to Mercury, Venus, Earth's Moon, and Mars
- Search criteria: mission, instrument, processing level, location, time, observation angle, PDS product ID
- Additional search tools for MRO coordinated observations and subsets of MOLA, LOLA, Diviner, and MLA
- REST interface for application programs
- High-speed download via Aspera service

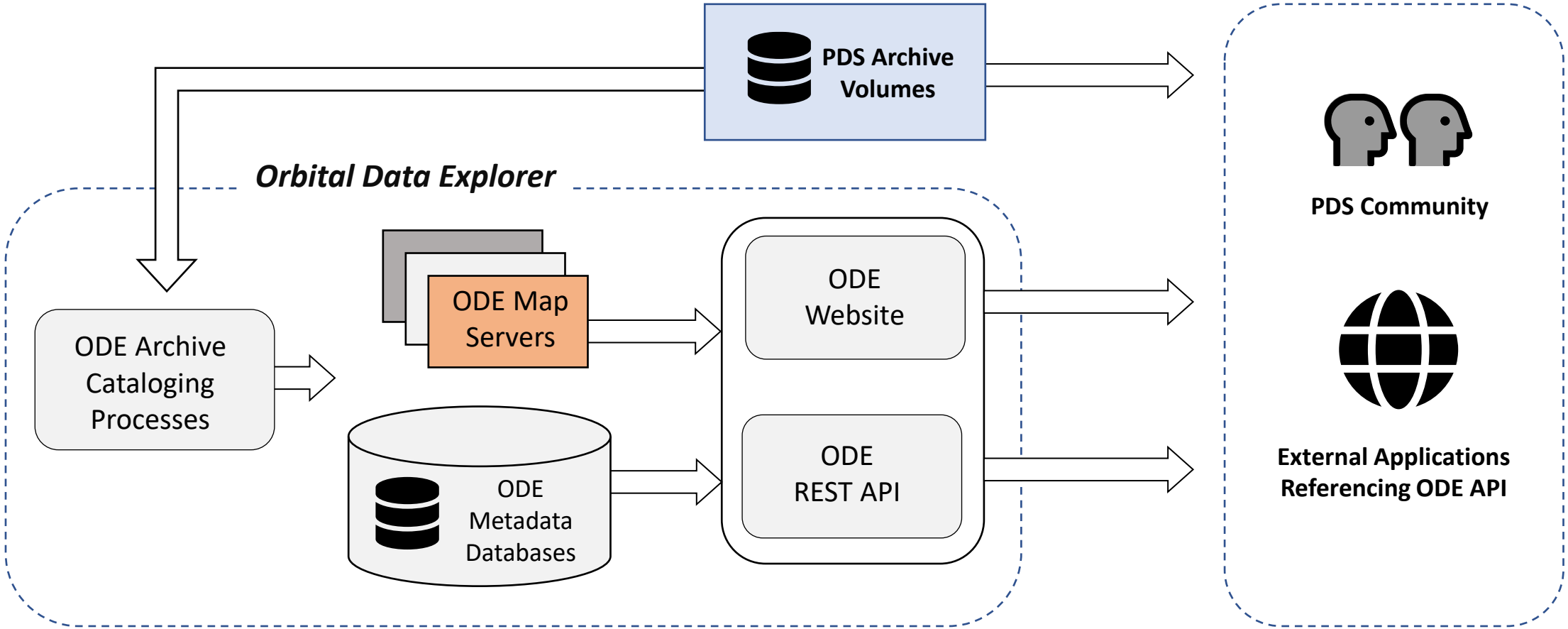


Mars ODE map-based search showing selectable MRO data coverage layers and sample freehand polygon selection of data at Jezero Crater.

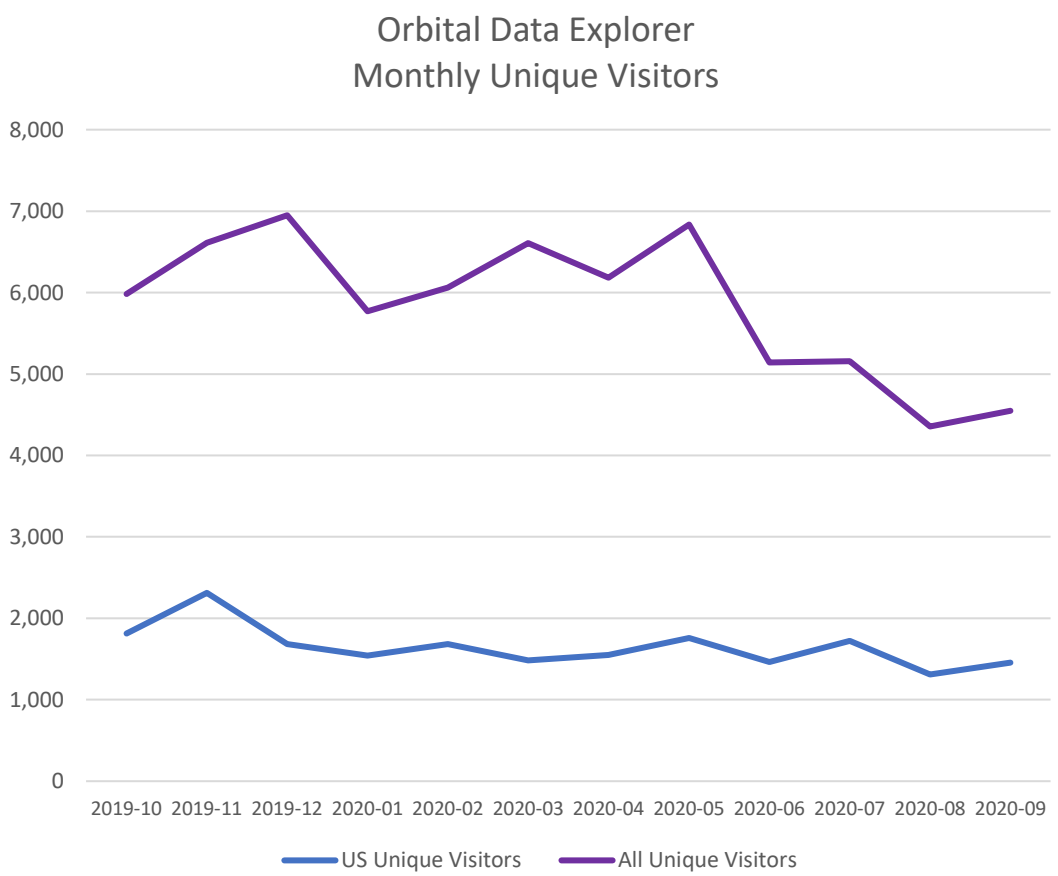
Orbital Data Explorer features

- Form-based search
  - Mission/instrument/processing level/observation type
  - PDS Product id (multiple values with wildcards are allowed)
  - Planetary location
  - Date and time filters
  - Observation angle
- Interactive map search
  - PDS product layers for map projected data sets
  - International Astronomical Union (IAU) Working Group for Planetary System Nomenclature (WGPSN) feature name layers
  - Various base maps
  - Same filters from form-based search
- Detail pages
  - Display metadata from PDS labels
  - Links to data files, ancillary files, and archive documentation
  - Related PDS product links
  - Map context for projected products
- Multiple download options
  - Individual products
  - Cart download
  - Via HTTP, FTP, and Aspera
- MRO coordinated observation search
  - CRISM, CTX, HiRISE, and MCS
- ODE GDS (granular data search)
  - MGS MOLA, LRO LOLA, LRO DIVINER, and MESSENGER MLA
  - Download csv, shape file, or binned image
- ODE REST API
  - Access to the same ODE information from code and scripts

Orbital Data Explorer data flow



ODE usage stats



Cart downloads (average/month), past 12 months

- 171,786 files
- 2,542 GB
- 108 unique users

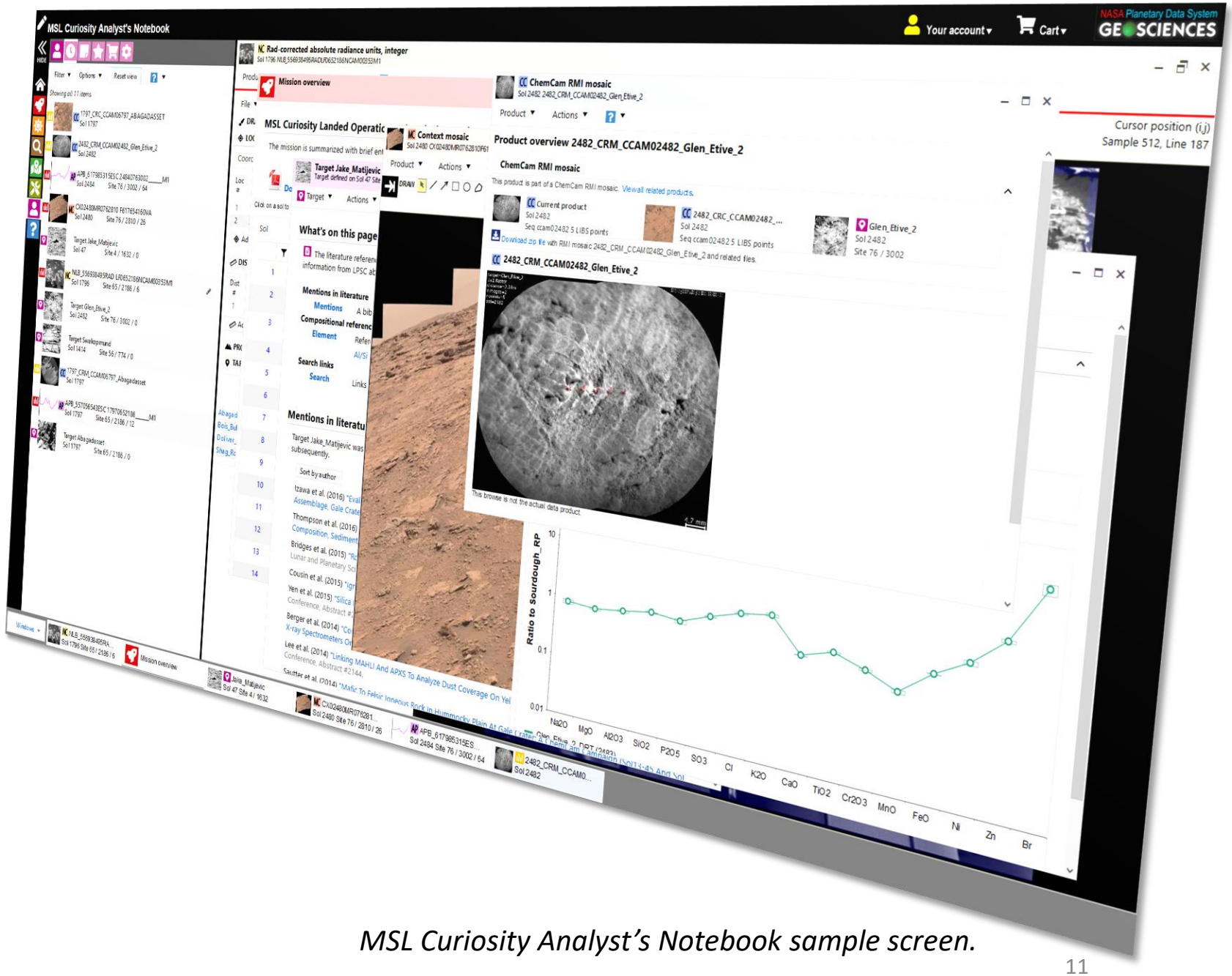
Analyst’s Notebook

https://an.rsl.wustl.edu

Analyst's Notebook

https://an.rsl.wustl.edu

- Provides integrated access to data, documentation, observation planning and targets for data from landed missions InSight, MSL, MER, Phoenix, LCROSS, and Apollo
- Mars 2020 Rover and Dragonfly to be added
- Public version accesses released data
- Team-only version ensures capture of science intent and operational context
- Data may be searched, displayed and downloaded via a shopping-cart model



MSL Curiosity Analyst's Notebook sample screen.

Notebook capabilities

Component	Search by	Capabilities
Data	Time, location, instrument, sequence	View PDS label, browse/full res image, measurement tools, derived products, SIS documents; download
Documents (Mission Manager and documentarian reports)	• Keyword *(for text, Word, Excel, PowerPoint, and PDF files)* • Time, role, filename, file type *(for all files)*	View/download documents
Targets	Name, links to data products, literature references	View target plotted on source frame, other images containing target
Plans	-	View high level sequence plan per sol
Mosaics	Time, location, instrument	Zoom on demand view, download

Additional capabilities

- Mission summary by sol
- Traverse map
- Data visualization tools (image measurement, plots of non-image data)
- Image file format transformation
- Cart based download
- Links to additional resources

Notebook components

Standard PDS Release

Archived Data
- Standard EDR and RDR data products

Documentation
- Software Interface Specification
- Spacecraft and instrument reports

Calibration Data
- Calibration reports and data

Additional data and tools in the Notebook

Special Products
- Additional products of interest
- Science team supplemental products

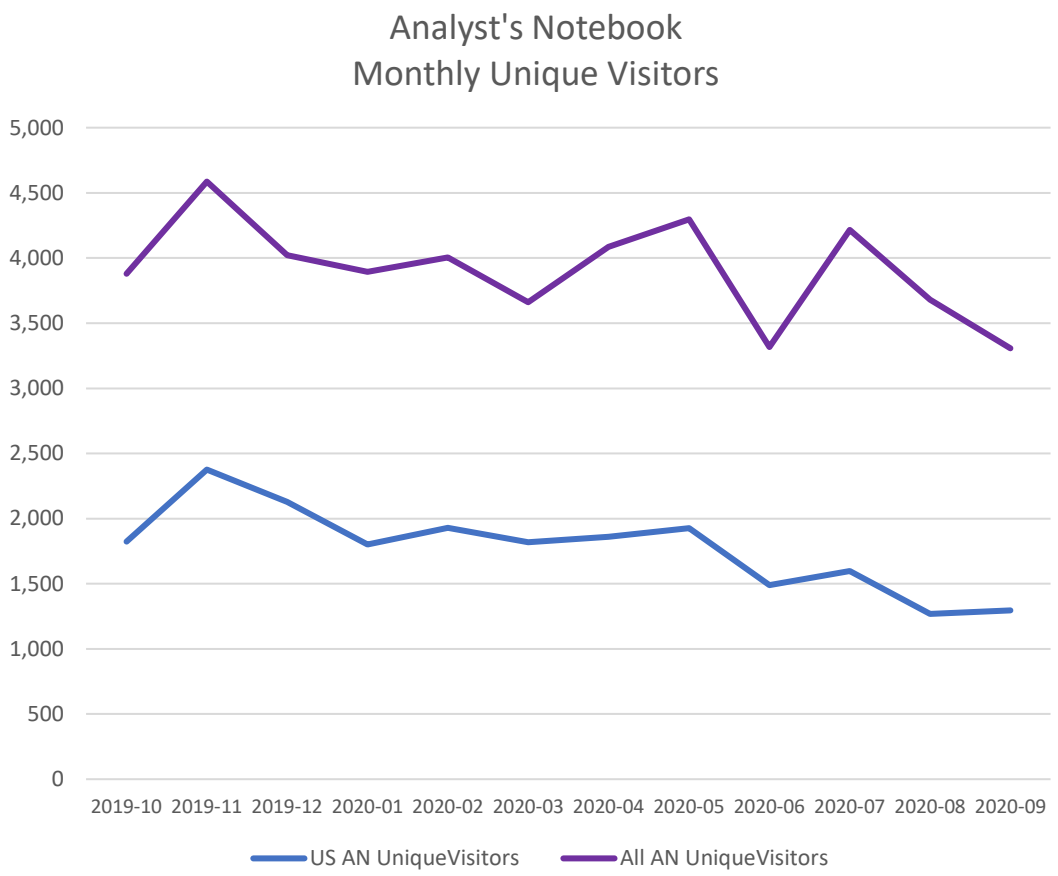
Documentation
- Daily operations reports
- Science team reports
- Historical reports

Resources
- Historical mission overview
- Science paper references
- Links to additional resources

Value Added Elements

Suite of tools and data representations that enhance archive use
- Data, document, and target search
- Interactive maps
- Context mosaics
- Image measurement
- Data transformation
- Cross instrument data browsing
- Integrated plans / timeline

AN usage stats



Downloads (average/month), past 12 months

- 49,552 files
- 72 GB
- 121 unique users

Links and support

Web site links

PDS Geosciences Node
https://pds-geosciences.wustl.edu

Analyst's Notebook
https://an.rsl.wustl.edu

Orbital Data Explorer
https://ode.rsl.wustl.edu

Spectral Library
https://pds-speclib.rsl.wustl.edu

Feedback and support

Geosciences Node data and web site
geosci@wunder.wustl.edu

PDS Geosciences Forum
https://geoweb.rsl.wustl.edu/community

Analyst's Notebook
an@wunder.wustl.edu

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ode@wunder.wustl.edu

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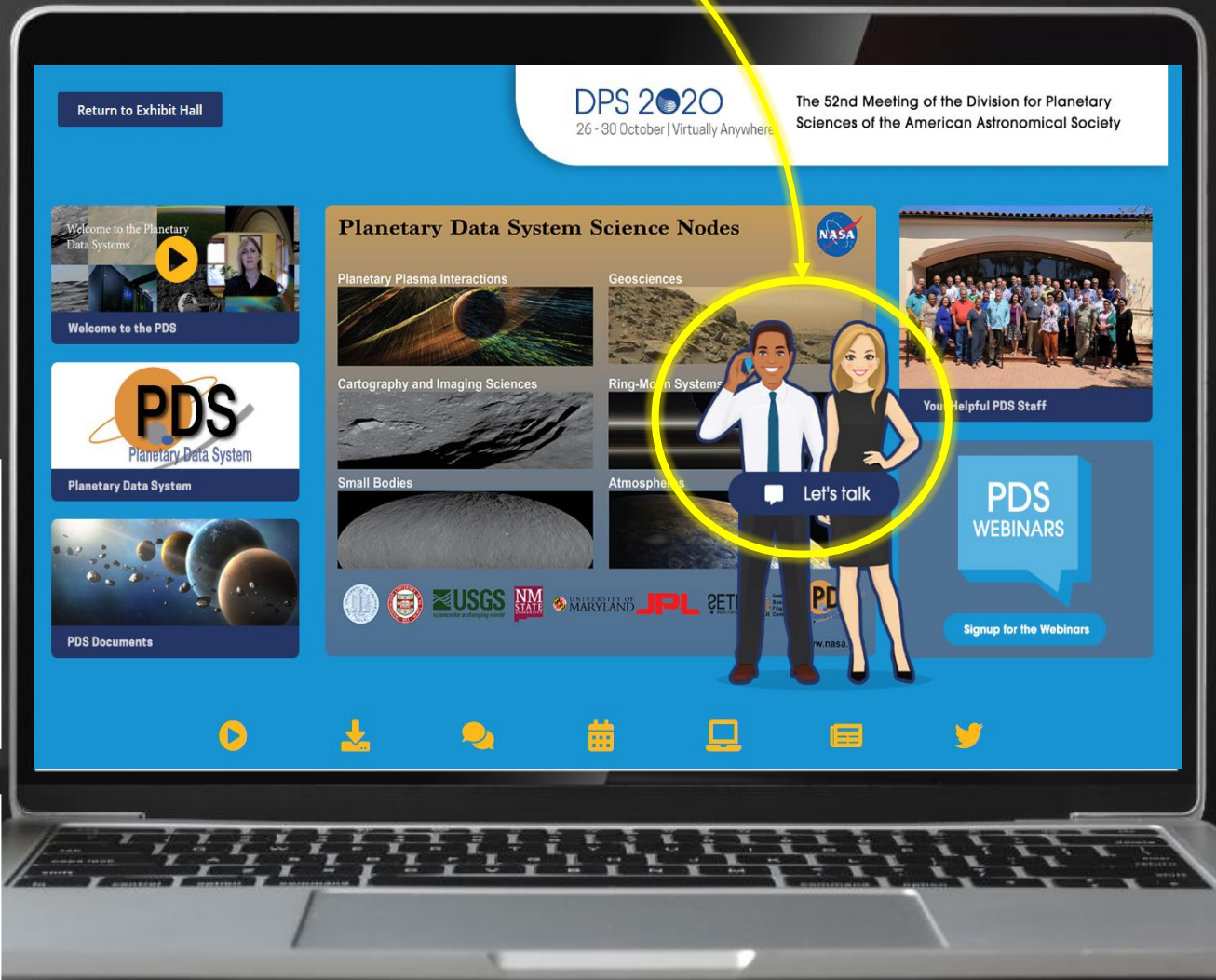

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