

NASA Solar System Treks: New Worlds, New Portals, New Updates. B. H. Day¹ and E. S. Law², ¹NASA Solar System Exploration Research Virtual Institute. NASA Ames Research Center. M/S 17-1. Moffett Field, CA, USA. 94035. (Brian.H.Day@nasa.gov), ²Jet Propulsion Laboratory, California Institute of Technology. M/S 168-200. 4800 Oak Grove Dr. Pasadena, CA, USA 91109. (Emily.S.Law@jpl.nasa.gov).

Introduction: NASA's Solar System Trek online portals (<https://trek.nasa.gov>) for lunar and planetary mapping and modeling provide web-based suites of interactive visualization and analysis tools to enable mission planners, planetary scientists, students, and the general public to access mapped data products from past and current missions for a variety of planetary bodies including the Moon, Mars, Ceres, Vesta, and eight of Saturn's moons. As web-based toolsets, the portals do not require users to purchase or install any software beyond current web browsers. These portals are being used for site selection and analysis by NASA and a number of its international and commercial partners, supporting upcoming missions.

During the past year, significant changes have been made to The Solar System Treks suite. New portals for the planet Mercury and the near-Earth asteroids (162173) Ryugu and (101955) Bennu have been added. Enhanced new versions of the Moon Trek and Mars Trek portals have been released. New visualization and analysis tools have been integrated. New data products have been ingested and new means of generating specific data products including image mosaics and DEMs have been implemented.

This presentation will provide an overview of the new releases in the Solar System Treks suite, highlight selected use cases, and solicit input for future products and enhancements.

Moon Trek: The updated release of the Moon Trek portal has new features such as spatial search, tools and layers being consistent across polar and global projections, and an intuitive layout for interfacing with Trek data. New data products include H-parameter mapping and Chang'e-2 global mosaic and DEM. New tools include rockfall detection, traverse path planning, line of site communications planning, and laser retroreflector study planning. We will demonstrate how the new portal is being used to support the Artemis program and landing site analysis.

Mars Trek: The updated Mars Trek adopts the new interface and search capabilities of the latest Moon Trek release. The addition of new tools including crater detection, rock detection, slope analysis, and subsetting along with new data products including global CTX mosaic and global sparse HiRISE mosaic provide enhanced value for planetary science studies and mission planning.

Mercury Trek: In its investigations of the planet Mercury, NASA's MESSENGER returned an immense amount of data detailing the dynamic surface of our solar system's innermost planet. As the Japanese and European space agencies prepared for the launch of Bepi-Colombo, the mission's project science team asked NASA to produce a new portal within the Solar System Treks suite featuring data returned by MESSENGER from Mercury. This new portal is designed both for mission planning and for public outreach by the Bepi-Colombo mission. While initially populated with Messenger data, the portal is also being designed to facilitate visualization, analysis, and dissemination of data from BepiColombo after it commences science operations in orbit around Mercury.

Ryugu Trek: JAXA's Hayabusa 2 mission recently completed a campaign of reconnaissance, sample collection, and rover deployment at the near-Earth asteroid (162173) Ryugu. At the request of JAXA and NASA HQ, we have produced a new portal for Ryugu. JAXA is providing mission data to SSTP, which is incorporating it into the new Ryugu Trek portal. The internationalized user interface features controls in both English and Japanese. The portal's bookmarks feature takes users to areas of particular interest for more detailed looks at specific landforms and sites. On Ryugu, we focus on the surface sample site, impactor and sub-surface sample site, as well as landing sites and traverse paths for the HIBOU, OWL, and MASCOT rovers.

Bennu Trek: NASA's OSIRIS-REx mission is currently conducting a detailed examination of the asteroid (101955) Bennu, another near-Earth object. At the request of NASA's Planetary Science Division and the OSIRIS-REx mission, SSTP implemented a new portal for the asteroid Bennu, featuring data that is being returned from OSIRIS-REx. The Bennu Trek portal reveals Bennu's top-like shape, a fascinating commonality with Ryugu. It also reveals details of Bennu's intensely boulder covered terrain. Bookmarked features include Nightingale, Osprey, Sandpiper, and Kingfisher, the top four candidates for sample collection as well as the first 12 landforms on Bennu to receive official names from the IAU and which are being used as landmarks for OSIRIS-REx's Natural Feature Tracking (NFT) navigation method that will guide the spacecraft down to its surface sample collection site.