

DISSEMINATING SCIENCE WITH NASA'S SOLAR SYSTEM TREKS. B. H. Day¹, E. S. Law², NASA Solar System Treks Team², ¹ NASA Solar System Exploration Research Virtual Institute. (NASA Ames Research Center, M/S 17-1, Moffett Field, CA, USA. 94035. Brian.H.Day@nasa.gov), ² Jet 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 Treks Project produces a suite of online, interactive visualization and analysis portals. These tools enable mission planners, planetary scientists, students, educators, and the general public to access data products from a wide range of instruments aboard a variety of past and current missions, for a growing number of planetary bodies. As new missions are being planned to a variety of planetary bodies, these tools are facilitating the public's understanding of the missions and engaging the public in the process of identifying and selecting where these missions will land. The Solar System Treks Project serves as an infrastructure component to NASA Science Mission Directorate's Science Activation Program engaging learners of all ages.

There are now seven web portals in the program available to the public. This expanded list includes portals for the Moon, Mars, Vesta, Ceres, and Titan. Icy Moons Trek features seven of Saturn's smaller icy moons. The latest addition is the new Mercury Trek portal. All of these are unified under a new project home site with supporting content. As web-based toolsets, the portals do not require users to purchase or install any software beyond current standard web browsers.

The portals of the Solar System Treks provide outstanding capabilities for scientists to share their work with each other and with the general public. This sharing can take several forms. Scientists whose results take the form of mapped data products can have their products considered for integration into the appropriate portals. They benefit from having their data disseminated to a wide, diverse audience and by having their data being presented in the context of other complementary data products. Researchers can also use the portals to generate visualizations and tell stories about their research that can be presented using the Trek clients or that can be ported to a wide range of media and venues. Missions can commission new portals for planetary bodies that they are studying so that they can highlight their mission and their results.

In this presentation we will show examples of how the Solar System Treks facilitate the sharing of research data with the public in a way that allows the public to work with the data in exciting and engaging ways.

Browser-Based Data Visualization and Analysis:

As web-based toolsets, the portals do not require users to purchase or install any software beyond current standard web browsers. All of the portals provide analysis tools that facilitate the measurement and study of planetary terrain. They allow data products to be layered and adjusted to optimize data visualization. Visualizations can easily be stored and shared. A new, improved Trek interface was introduced this year for the project's Moon Trek portal. It provides enhanced search, 3D visualization and navigation. Standard keyboard gaming controls allow the user to maneuver a first-person visualization of "flying" across the surface of the Moon. User-specified bounding boxes can be used to generate STL and/or OBJ files to create physical models of surface features with 3D printers. Such 3D prints are valuable tools in museums, public exhibitions, and classrooms – notably including opportunities for the visually impaired. This interface will become the standard across all of the Trek portals. The data visualization capabilities of the portals provide easy access to data from NASA and other agencies, allowing the public to personally explore these destination worlds, and become directly engaged in current missions as well as plans for future exploration.

Summary and Conclusions: Imagery from the international fleet of spacecraft exploring the solar system provides a unique and particularly effective means to engage, inspire, and educate students and the public. NASA's online, web-based Solar System Treks planetary mapping and modeling portals provide exciting, interactive tools of great value to informal educators, as well as to scientists working to share the excitement of the latest developments in planetary science and exploration. The user community is invited to provide suggestions and requests as the development team continues to expand the capabilities of the portals, the range of data and tools that they provide, and partner in new ideas for their application in STEM engagement and outreach. As we look forward to a new generation of surface and orbital lunar robotic activities, as well as preparation for human return to the Moon, and the first human missions to Mars, tools such as the Trek portals will become increasingly essential to engage and involve students and the public.

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