



Mars Exploration Rovers Portal to Observations, Resources, and Tools to Advance Legacy Science (MER PORTAL): Expanding the Heritage of an Historic Planetary Mission



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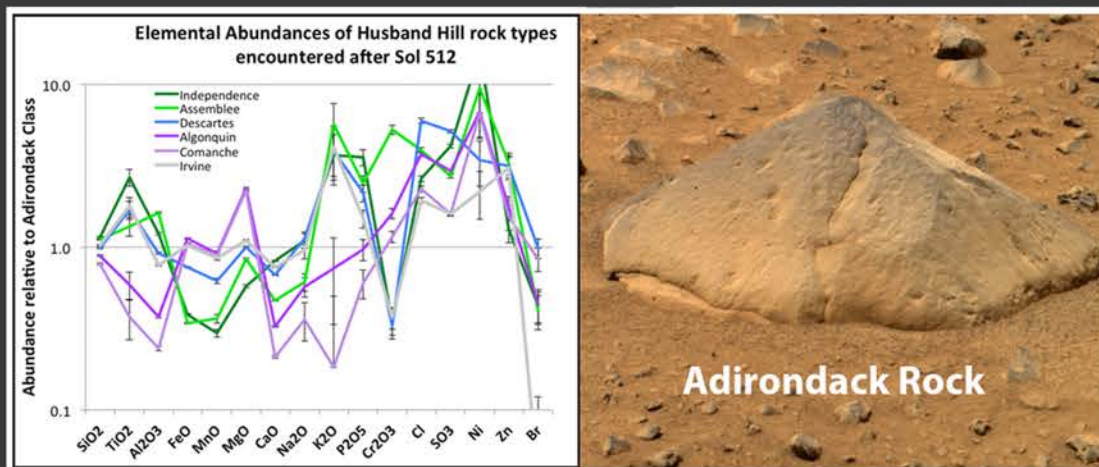
- An intuitive **science-based search** capable of downloading data products from the Planetary Data System (PDS)
- Contextual information** and **data quality indicators**
- User Guides** that enable data analysis
- Visualization tools** and other tools requested by the user community¹

Do you want to use Mars Exploration Rover (Spirit and Opportunity) data? The MER PORTAL is for you! Our goal is to ensure that people without a connection to the mission have what they need to find and analyze MER data.


Welcome to the MER PORTAL

What would you like to do?

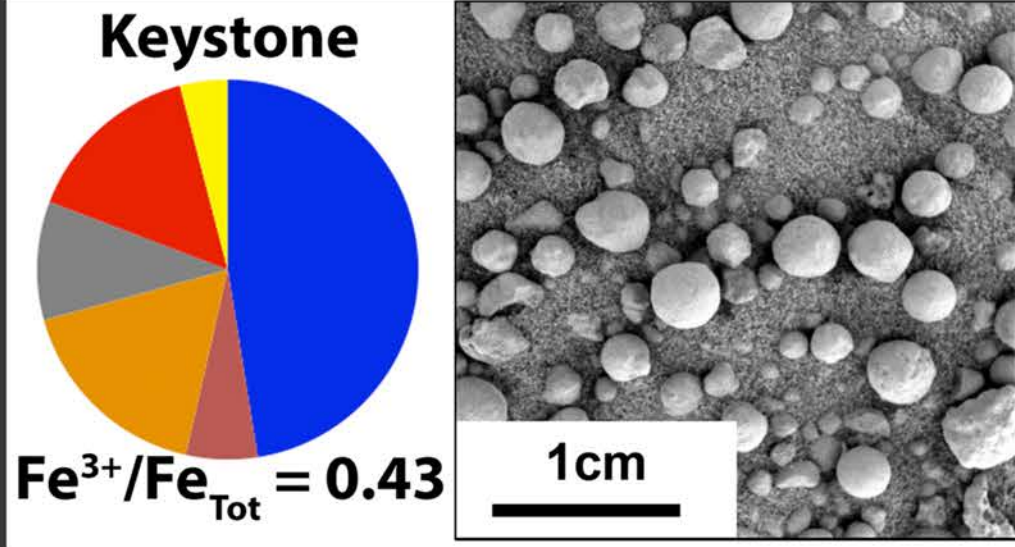
Find data




Find pretty pictures



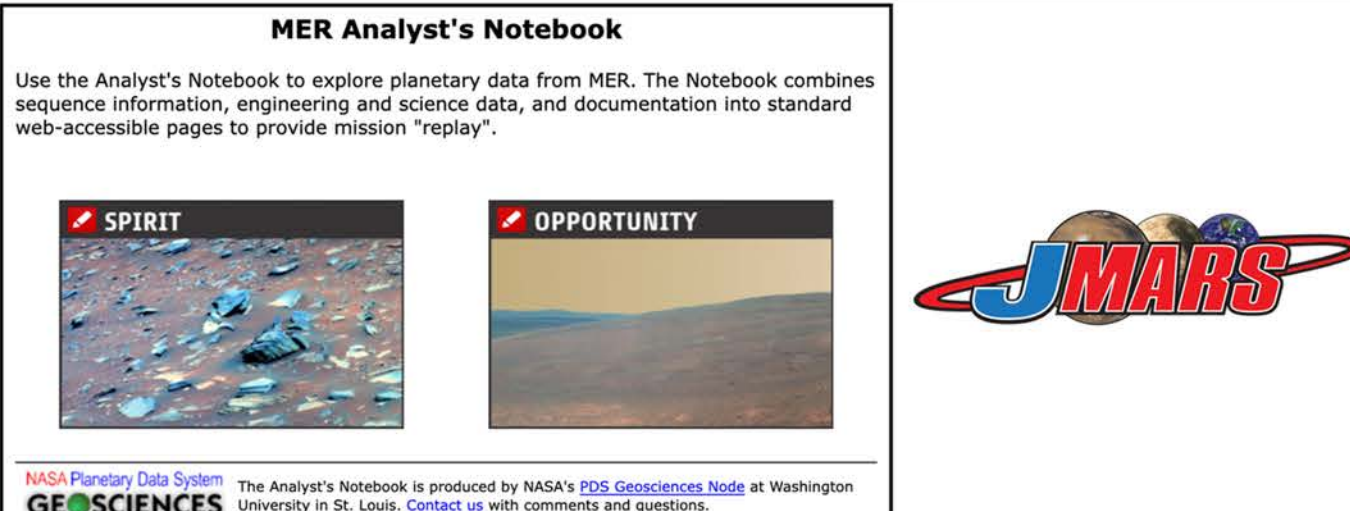
Learn how to analyze MER data




Learn about the MER vehicle and instruments



Find tools and websites relevant to analyzing MER data



Find websites and publications relevant to the MER mission



Links to existing MER-related tools and websites

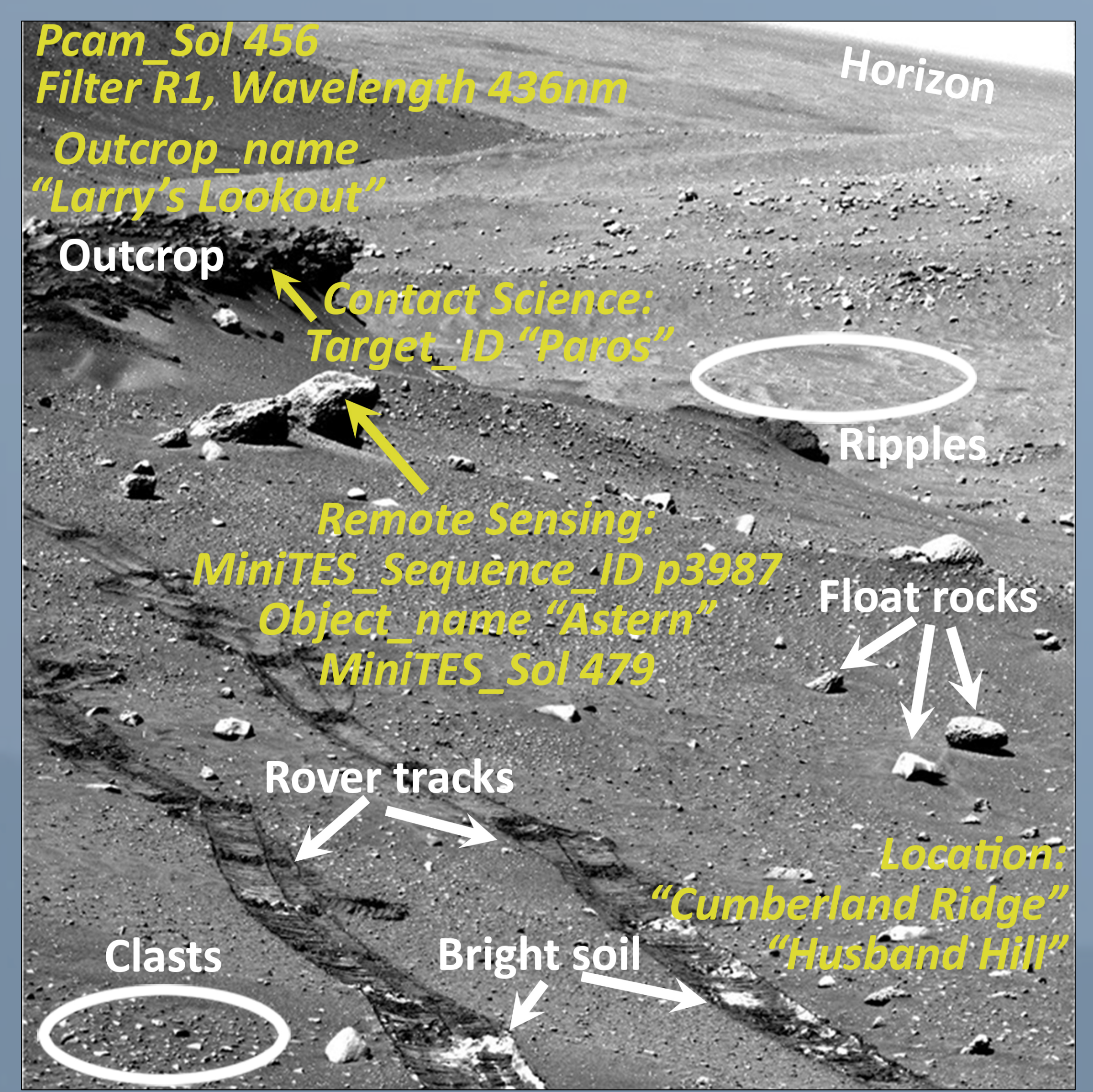


Fig. 1. Do you want to search for named rocks and soils, meteorites, compositional classes, bedforms, geographic locations, bright soils, dust devils, or other elements annotated on this image? Our user-friendly search will enable anyone from casual users to experienced Mars researchers to find what they're looking for. Spirit Sol 456 Pancam image 2P166850381RADA9DWP2279R1C1.

FUTURE CAPABILITIES

We plan to develop an intuitive, user-friendly, science-based search interface that will include (see Fig. 1):

- Objects and phenomena in MER images
- Data quality indicators (e.g., spectrometer integration time, comments noted by the operations team)
- Dates and times in multiple formats (Sol, Earth date, Local True Solar Time, etc.)
- Informal names used by the MER team

Members of our team have begun cataloging MER image content using Machine Learning^{2,3}; a preliminary science-based image search is available on the PDS Image Atlas⁴.

GET INVOLVED!

If you

- Have any questions,
- Would like to beta-test our materials, or
- Are a MER team member who'd like to contribute

Please contact us!
scole@spacescience.org

OUR TOP PRIORITIES

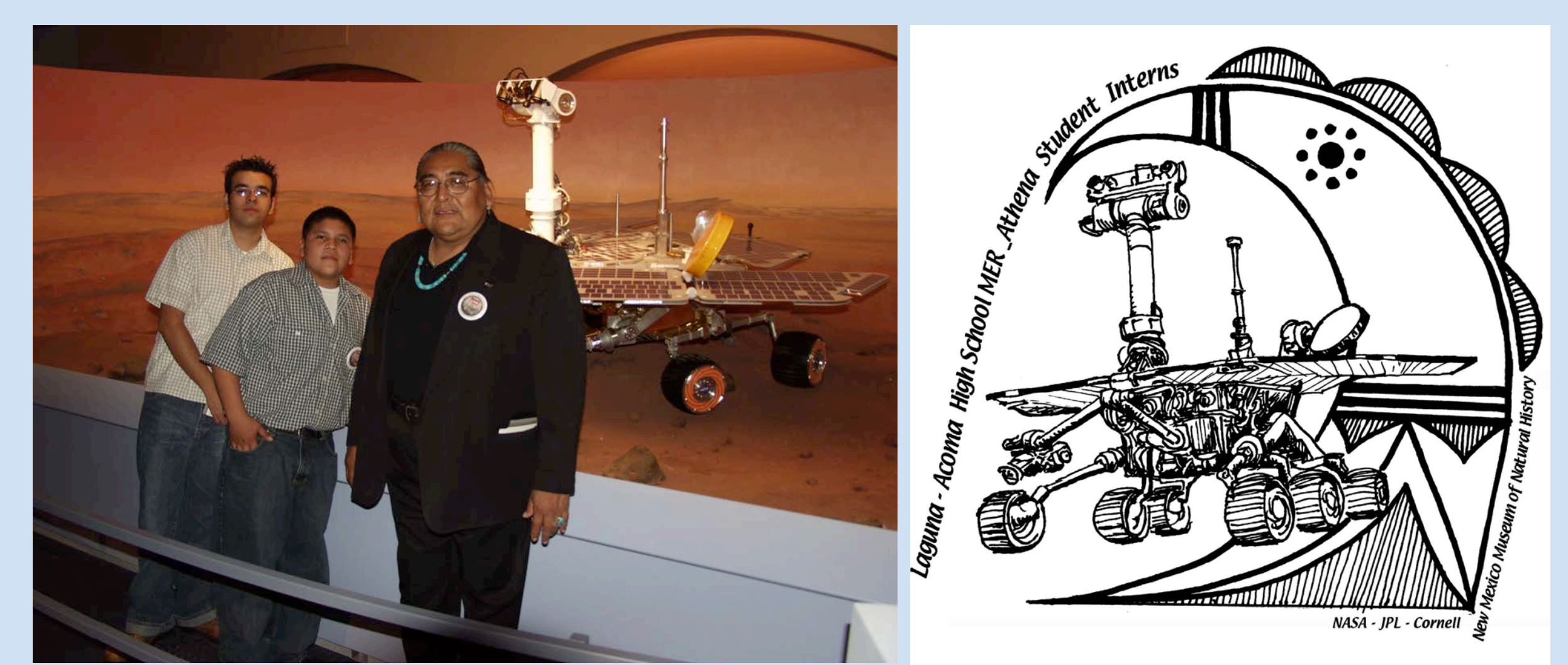
The first stage of the MER PORTAL is funded by a PDART21 (Grant No. 80NSSC23K0022). Our initial website, scheduled to launch in 2025, will include:

- **Data Analysis User Guides**, based on interviews with our MER team Collaborators, akin to the guidance one would give one's graduate students
- **Guides** to the MER vehicle and **instruments**
- **MER Image Interpretation** Training Materials, and college-level **Lesson Plans** based on them
- **Datasets** generated by MER team members
- A list of **online tools and websites** relevant to MER data analysis and the MER mission

EQUITY, DIVERSITY, INCLUSION, AND ACCESSIBILITY (EDIA)

EDIA is at the core of the MER PORTAL. Aspects of our organization relevant to EDIA include:

- A collaboration with the Southwestern Indian Polytechnic Institute (SIPI), based on long-standing relationships, to work with (and pay) a SIPI teacher to develop MER Image Interpretation Lesson Plans
- A paid Accessibility Consultant who identifies as a person with disabilities
- An Ombud to mediate any misunderstandings or interpersonal issues



MER PORTAL Co-I Jayne Aubele has been working with Native American and Hispanic students on Mars projects since the start of the MER mission. Shown are students Mark Vallejos from Seboyeta, NM, and Brandon Herrera of Laguna Pueblo, with their teacher Joseph Aragon of Acoma Pueblo. Co-I Aubele has continued contact with these students, and they will help review and test the lesson plans.

REFERENCES AND ACKNOWLEDGEMENTS

¹Cole et al. (2020), LPSC LI, Abstract #1709, <https://www.hou.usra.edu/meetings/lpsc2020/eposter/1709.pdf>.
²Lu et al. (2021), LPSC LII, Abstract #1779, <https://www.hou.usra.edu/meetings/lpsc2021/pdf/1779.pdf>.
³Zhao et al. (2020), MER Opportunity and Spirit Rovers Pancam Images Labeled Data Set (Version 1.1.0), <https://zenodo.org/record/4302760>.
⁴<https://pds-imaging.jpl.nasa.gov/search>.

This material is based upon work supported by the National Aeronautics and Space Administration under Grant No. 80NSSC23K0022. The work was also assisted and supported by the Space Science Institute, which was the recipient of the grant. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NASA or the Space Science Institute.