

TREX SCIENTISTS LEADING PUBLIC ENGAGEMENT. S. R. Buxner¹, A. R. Hendrix¹, J. A. Grier¹, J. Molaro¹, D. L. Domingue¹, M. Lane², M. Banks³, E. Z. Noe Dobrea¹, R. N. Watkins¹, T. H. Prettyman¹, S. Wright¹, C. Wood¹, L. C. Quick³, L. Lebofsky¹, and P. L. Gay¹, ¹Planetary Science Institute (1700 E. Fort Lowell Suite 106, Tucson, AZ 85719, buxner@psi.edu), ²Fibernetics LLC, ³NASA Goddard Space Flight Center.

Introduction: The Toolbox for Research and Exploration (TREX) is a node of NASA's Solar System Exploration Research Virtual Institute (SSERVI). TREX aims to develop tools and research methods for exploration of airless bodies, like the moon and asteroids, that are coated in fine-grained dust in order to prepare for human missions. Laboratory spectral measurements and experiments accompany studies of existing datasets to understand surface characteristics and to investigate potential resources on airless bodies. The TREX team is made up of multidisciplinary scientists from 12 institutions.

TREX addresses Science and Exploration through 4 Themes: 1) development of UV-MIR spectral library of planetary materials measured in TREX labs under planetary conditions, 2) investigations of fine-grained materials on the lunar surface applying Theme 1 lab data to investigate grain sizes, composition and ISRU possibilities using a variety of lunar datasets and modeling, 3) investigations of fine-grained materials on the surfaces of small bodies applying Theme 1 lab data to investigate grain sizes, composition and in-situ resource utilization possibilities using a variety of Phobos, Deimos and asteroid datasets and modeling, and 4) decision-making in a fine-grained analog environment applying the results from Themes 1-3 toward software development and instrument testing for use in the field.

Public Engagement: TREX Public Engagement includes a public website that shares scientific discoveries, scientists' stories, and multimedia resources. Additionally, TREX Public Engagement includes social and new media including interactions through Twitter, blogs, and videos. Scientists give public presentations at museums, schools, and other informal education venues.



TREX public website: <https://trex.psi.edu/>

Scientist Engagement: Through a formal proposal for public engagement, eleven TREX scientists were selected to actively plan and implement the TREX Public Engagement effort. An additional four scientists and education and communication specialists joined the TREX Public Engagement team to support the overall effort.

General Public Engagement. In the last year, scientists have participated in public talks, public events, classroom presentations, museum presentations, and other informal events to support overall science engagement in planetary science and exploration. In the summer of 2019, TREX scientists supported Apollo 11 50th anniversary events across the country including on the National Mall in Washington DC, at the Museum of Flight in Seattle, Washington, and at the Wings Over the Rockies Air and Space Museum in Colorado.

Science Communicators Workshop for Disabled Writers. This workshop will be a 7-week online workshop specifically for disabled writers (self-identified from inclusive physical and mental disabilities) who want to expand the work to include enhanced scientific perspectives. The goals of the workshop will be to promote and support disabled writers interested in space science, to create a collaborate and supportive network of writers and scientists, to provide a new public voice in space science that includes disability and other intersectional concerns, and to provide the public with an inclusive view of science and the scientific process. The workshop will support up to 20 disabled writers who want to include and promote space science in their writing and will begin in the spring of 2021.

TREX Artist in Residency Program. This collaborative program will engage both scientists and artists and result in artwork that will be displayed in public spaces and at scientific meetings. Scientists will create art prompts that include themes, ideas, data from their research. Additionally, scientist will engage in in-person and virtual interactions with artists to talk about their research and data. At least one artist will participate in field research alongside the scientific team.

Additional Information: This material is based upon work for the TREX team supported by the National Aeronautics and Space Administration (NASA) through the Solar System Exploration Research Virtual Institute 2016 (SSERVI16) Cooperative Agreement (NNH16ZDA001N).