

TREX PUBLIC ENGAGEMENT: VIRTUAL ENGAGEMENT THROUGH THE FIRST YEAR OF THE PANDEMIC. S. R. Buxner¹, A. R. Hendrix¹, J. A. Grier¹, T. H. Prettyman¹, D. L. Domingue¹, M. D. Lane², M. E. Banks³, R. N. Watkins⁴, L. C. Quick³, E. Z. Noe Dobrea¹, L. A. 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, ⁴NASA Headquarters.

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 that are coated in fine-grained dust, like the Moon and asteroids, in order to prepare for human missions. The TREX team completes its science and exploration goals with four teams aligned with the four Science and Exploration Themes of TREX: 1) TREX Spectral Library – the development of a UV-VNIR-MIR spectral library of planetary materials measured in labs under planetary conditions, when possible, 2) Lunar Datasets and Models - 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) Small Body Science - 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) Analog Environments - 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 with a rover.

Impact of the Pandemic on TREX Public Engagement: All planned public engagement for TREX came to a halt in early March 2020 due to national closures of businesses, K-12 schools, universities, museums, and the cancellation of public events. Once it became apparent that closures would remain long-term, the TREX Public Engagement Team reached out to partners to determine how to best support them, and their audiences, virtually.

Virtual Engagement: TREX scientists and the TREX Public Engagement team have partnered with Chabot Space and Science Center and Howard University in long-term partnerships through ongoing programming. During the summer and fall of 2020, the TREX team gave seven virtual talks to the Chabot Space and Science Center Galaxy Explorers, a group of high school volunteers who engage with the community and continue their own professional development through the program. This partnership will continue in 2021 as Chabot prepares to open for in-person visitors.

TREX has also partnered with Howard University to provide virtual talks on planetary science and

exploration for undergraduate physics and astronomy students to expand their understanding of possible future fields of study and job possibilities. TREX scientists met with students four times during the fall semester. This collaboration will continue into 2021 with the intention of expanding to work with students at additional Historically Black Colleges and Universities (HBCUs).

TREX team members continue to provide virtual presentations for camps and clubs as well as support for virtual events. TREX content experts provided support for the 2020 International Observe the Moon Night NASA livestream event (Figure 1).



Figure 1: TREX PI Amanda Hendrix and Co-I Ryan Watkins supporting the 2020 International Observe the Moon virtual livestream.

Future Public Engagement: We will continue adapting to changing conditions and working with partners to provide virtual content including talks, training, and content for exhibits. In 2021, we will recruit participants to host a *Science Communicators Workshop for Disabled Writers*. This will be a 7-week online workshop specifically dedicated to disabled writers (self-identified from inclusive physical and mental disabilities) who want to expand their work to include enhanced scientific perspectives.

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