WALK ON MARS: PROGRAM OVERVIEW AND INITIAL LESSONS LEARNED. J. R. Hill[1] and P. R. Christensen[1], [1]School of Earth and Space Exploration, Arizona State University, Tempe, AZ (jonathon.hill@asu.edu).

Introduction: The Thermal Emission Imaging System (THEMIS) [1] onboard the 2001 Mars Odyssey spacecraft has acquired over 230,000 infrared images of the Martian surface at a resolution of 100 m/pixel since the start of science operations in February 2002. A global map was previously developed by mosaicking together over 24,000 high-quality full-resolution THEMIS daytime infrared images [2] and colorizing it using MOLA [3] elevation data. Although the resulting map has been extremely valuable for scientific and mission operations applications, it has been difficult to communicate this value to students, citizen scientists and the general public, since their interactions with the map have been limited to computer-based geographic information system (GIS) interfaces.

In order to better communicate the value and importance of mapping the entire Martian surface at 100 m/pixel resolution, we determined that people need to experience the map's true scale. Therefore, the THEMIS Day IR with Colorized MOLA Elevation Global Map has been printed on a 47.5ft x 95ft vinyl mat, which will allow observers to walk across the map and view it at approximately full resolution (~200 pixels per inch).

Map Details: The size of the map (47.5ft x 95ft) was chosen to fit on a standard basketball court (Figure 1), so that a large number of schools will have a sufficiently large indoor surface on which to display the map for education and public outreach events. Due to the vinyl material used, the map must be displayed on smooth or carpeted surfaces in order to avoid damage. Displaying the map on uneven or rough surfaces could cause damage to the vinyl mat and/or the printed surface.

A simple cylindrical projection centered on the prime meridian was chosen because it maximizes use of the printed surface, which is inherently rectangular, while avoiding the division of any major surface regions between the two ends of the map.

In addition to the simple cylindrical map, there are two smaller (15ft x 15ft) polar stereographic maps centered at each pole, which will be displayed along with the simple cylindrical map when sufficient additional space is available (Figure 2). These smaller maps are designed to give participants a better understanding of the Martian poles, which are significantly distorted in the simple cylindrical map. Both polar maps use custom MOLA elevation color scales in order to better emphasize the topography of the ice deposits at each pole.

The vinyl base material and large-format printing process selected for the map have proven to be wear-resistant in similar applications by the National Geographic Society's Giant Maps program [4] and the Arizona Geographic Alliance's Giant Arizona Floor Map program [5]. For events where viewers are able to walk across the map, they will be required to wear only socks or similarly soft foot coverings in order to prevent wear on the printed surface.

Map Activities: While there are numerous potential uses of this map for education and public outreach events, the initial test events will focus on two specific activities.

Walk on Mars: This activity will be used for public outreach events where relatively large numbers of participants are expected and multiple Mars experts are available to explain the various features on the Martian surface. The Mars experts will be stationed at major topographic features (Olympus Mons, Valles Marineris, etc.) and important landmarks (Gale Crater, Gusev Crater, etc.). They will give short talks (2-3min) about their locations and answer questions as participants walk between the stations. This will give participants the opportunity to freely walk across the map and stop at the locations that pique their interest.

Tour of Mars: This activity will be used for education events where small groups of participants are expected and at least one Mars expert is available to explain the map. The Mars expert will guide the small group around the map, stopping at major topographic features (Olympus Mons, Valles Marineris, etc.) and important landmarks (Gale Crater, Gusev Crater, etc.) in order to explain them. This will give participants the opportunity to walk across the entire map in a structured format and learn about important locations during a time-limited tour period.

Test Events: Three test events have been scheduled for February 2018, which will be used to test and validate the planned map activities.

The first event will be a "soft opening" for the staff of the ASU Mars Space Flight Facility and the School of Earth and Space Exploration. This event will test the procedures for laying out the map, verifying all participants are only wearing socks while on the map, and packing the map following the event. Expected attendance is ~50 people.

The second event will be a "Tour of Mars" education event at a local elementary school. At least one Mars expert will guide classes (~30 students each) on a tour of the major features on Mars and answer the students' questions. This event will test the "Tour of Mars" activity model, as well as the logistics of accommodating a

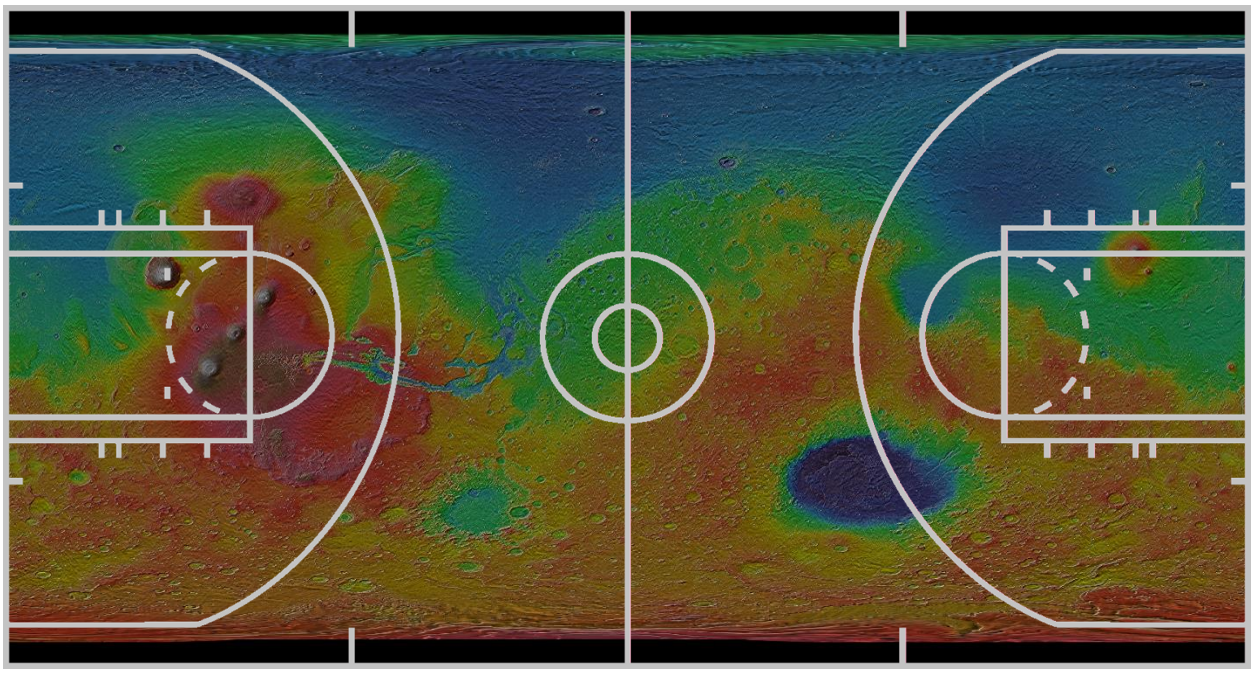

Figure 1. THEMIS Day IR with Colorized MOLA Elevation Global Map (Simple Cylindrical Projection) with Basketball Court Markings for Scale

larger number of participants. Expected attendance is ~500 people over two days.

The third event will be a "Walk on Mars" public outreach event for the ASU Open Door 2018 public open house. Approximately 10 Mars experts will be stationed at important locations on the map and will interact with participants as they freely walk around the map. This event will test the "Walk on Mars" activity model, as well as the logistics of accommodating a very large number of participants. Expected attendance is ~750 people over six hours.

Lessons Learned: A summary of the lessons learned from these three test events will be compiled and presented in March 2018, with an emphasis on how the map could be used more effectively at subsequent events. Future plans for utilizing the map for education and public outreach will also be discussed.

Acknowledgements: This project was partially inspired by the National Geographic Society's Giant Maps program, was assisted by the Arizona Geographic Alliance, and was largely funded by the Arizona State University School of Earth and Space Exploration Summer Exploration Graduate Fellowship program.

References: [1] Christensen et al. (2004) Space Sci Rev 110: 85-130. [2] Hill and Christensen (2017) J. Geophys. Res. Planets, 122, 1276–1299. [4] https://www.nationalgeographic.org/education/giant-maps/ [5] https://geoalliance.asu.edu/GiantTravelingMap

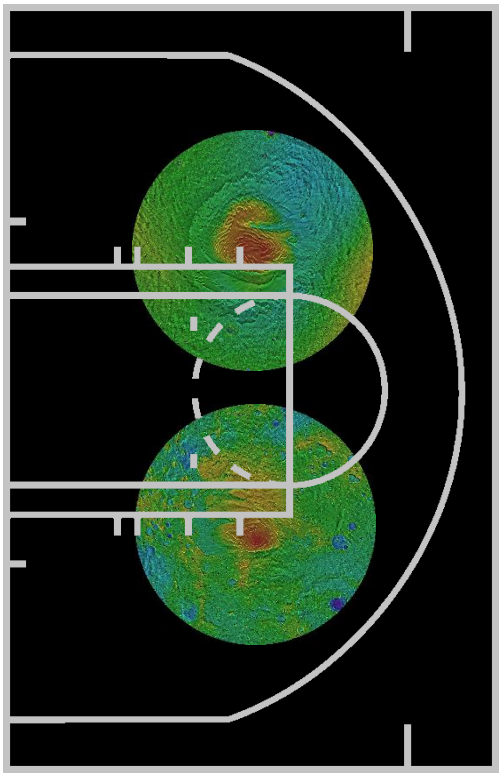

Figure 2: THEMIS Day IR with Colorized MOLA Elevation Global Map (North and South Polar Stereographic Projections) with Basketball Court Markings for Scale