NASA MarsXR Challenge - Virtual Reality EVA Scenarios

Category - Exploration

Exploration is in Humanity's DNA.

We are interested in all the tasks related to the exploration of Mars outside of the habitat while wearing an exploration spacesuit. This includes transportation using ground vehicles and exploring geological features, including craters and lava tubes that the astronauts will find on Mars. We are also interested in the set-up and use of navigational aids, deployment, and retrieval of instruments, processes, and aids for climbing cliffs or other geological features.

This category includes any extravehicular tasks in support of exploring Mars. This category does not include any crew tasks inside the habitat or spacecraft.

What you can work on:

Below is a list of possible scenarios that teams can explore. This list is not all-inclusive, and you can create other potential scenarios not listed here. The scenarios will need to be realistic and solve an actual task the astronauts will need to perform on Mars to support their scientific tasks.

If you are developing a scenario, please consider that this challenge is about developing tasks for what are called Extravehicular Activities (EVA). EVAs are all activities performed outside the habitat and wearing an exploration spacesuit. We will not focus on any activity inside the habitat or spacecraft for this challenge. Scenarios may start from the moment the crew has exited the Habitat Airlock, or they may start anywhere on the surface of Mars (covered by the NASA XOSS MarsXR Engine). Teams will need to define if the scenarios are single or multiplayer modes. All scenarios should be undertaken with multiple crew members working as a team, and EVAs are never undertaken with a single crew member working by themselves.

If you are developing an asset, each asset developed will need to be used in single and multiplayer modes.

List of Potential Scenarios

1. Explore the crater area. Navigate crater wall while carrying hand tools to conduct research. Navigate using maps and other aids, return to the starting location. The crew will need to assist each other.

2. Explore lava tube while carrying hand tools to conduct geological research. Record visual and written records of specific geological samples, collect ten (10) samples, and store the samples separately to avoid cross-contamination.

3. Walk to the crater wall and deploy and configure communication antennas along the ridge. Verify good communications in the crater.

4. Deploy an unpressurized surface rover and drive the rover over an extended distance.

5. Setup and use a drone to explore the surface.

List of Potential Assets

1. Navigation aids, mini-maps
2. Penetration instruments to evaluate Lava tubes.
3. Toolbelt - suit inventory system
4. Unpressurized surface rover