NASA MarsXR Challenge - Virtual Reality EVA Scenarios

Category - Blow Our Minds

This is where you can surprise NASA with your ideas and innovative concepts. This is an open category, where you can submit your own concepts for the future exploration of Mars. We are including here any and all scenarios not covered in the other categories.

Here you can propose your own tools, vehicles, drones, robots, add failure modes, suits displays, or any other idea you may have to help us to create the first mission to Mars.

This category does not include any tasks that the crews will perform inside the habitat or spacecraft, but only the tasks that the astronauts will perform while wearing an exploration spacesuit.

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. Any other scenarios that you can surprise us with! - we would like you to blow our minds with what you can do with the XOSS engine.

If you need some focus you could look at one of the following possible Scenarios:

1. Integrate Unreal Chaos Physics into the NASA XOSS MarsXR Engine
2. Additional weather elements including (develop scenarios and physics within the NASA XOSS MarsXR Engine)
    a. Particle movement dust
    b. Wind direction
    c. Temperature
    d. Solar flares event
    e. Elevated radiation event
3. Remove weather balloon and portable hydrogen tanks from rover trailer, fill a balloon, attach remote sensors/transponders, and deploy balloon to conduct the survey.
4. Transport incapacitated crewmate 20 meters to surface rover to prepare for medical treatment.
5. Troubleshoot robot problems visually/manually/cognitively to determine if the equipment is repairable in the field.
6. Identify and replace components (replaceable line units, wheels, etc.) to restore surface robot functionality.
7. Inspect hoses from fuel production plant to fuel storage tanks, remotely using surface robot vehicle, to ensure there is no leakage.
8. Inspect pre-positioned fuel production plant, remotely using surface robot vehicle, to verify proper functioning.
9. Troubleshoot Leak/s in exploration spacesuit
10. Test for fatigue, performance, and alertness

List of Potential Assets

1. Spacesuit heads up display, wrist-mounted display
2. Weather balloon
3. Surface drone
4. Robotic assistant
5. Helicopter drone
6. Adding failure modes to assets (drill stops working and you need to do X to fix it)
7. MMSEV (Multi-mission surface exploration vehicle; i.e. rover)
8. Exploration spacesuit - interaction with suit systems
9. Exploration spacesuit - Food and drink