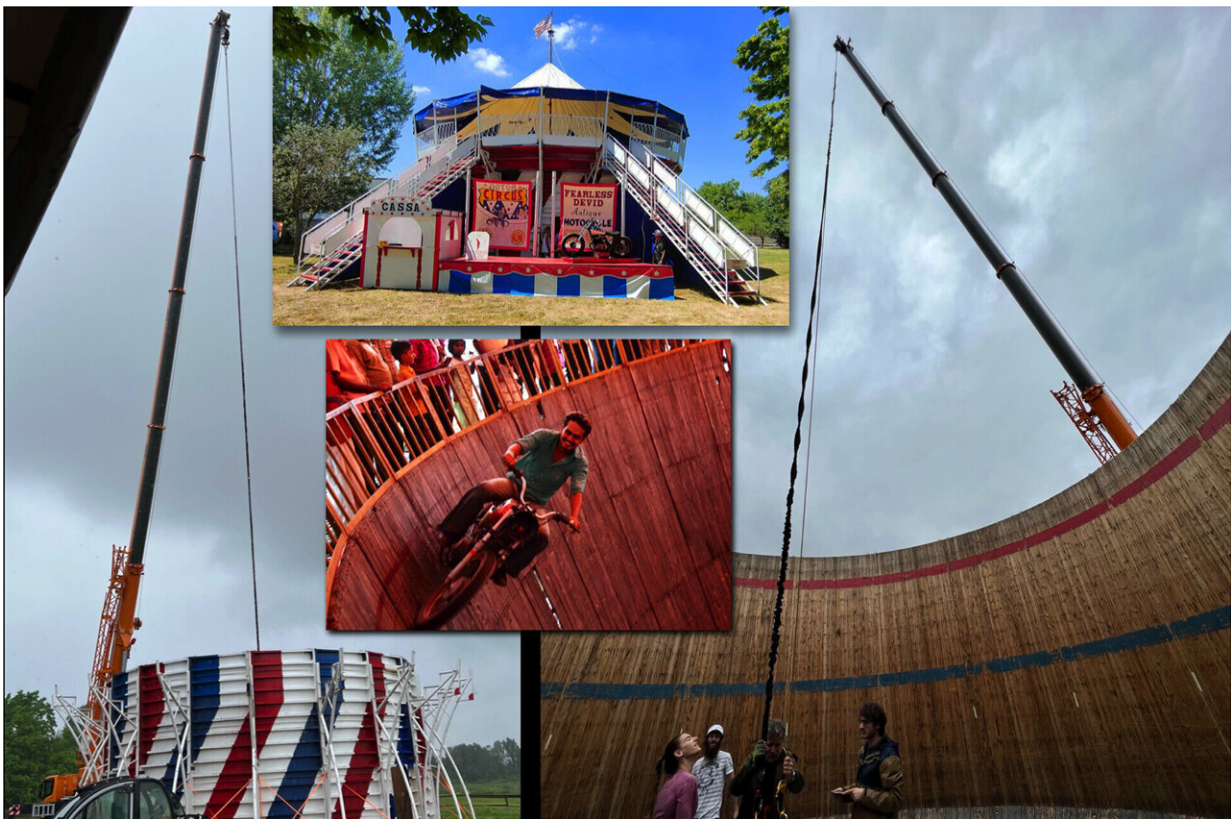


Horizontal running could help lunar astronauts retain physical conditioning

May 1 2024, by Bob Yirka



Top inset shows the Wall of Death (WoD) used in this investigation; left picture represents its 'naked' version, with the cap removed as to allow the telescopic crane to hang the body weight unloading bungee cords from a height of 36 m; right picture shows the vertical wall inside the WoD where horizontal running experiments took place at emulated (vertical) lunar gravity; middle inset displays

a rider driving fast, with the peculiar upward leaning posture, during a WoD show. Credit: *Royal Society Open Science* (2024). DOI: 10.1098/rsos.231906. <https://royalsocietypublishing.org/doi/10.1098/rsos.231906>

A small team of pathophysiologicalists and human locomotion specialists at the University of Milan has found that it should be possible for astronauts on the moon to prevent muscle and bone deterioration by running horizontally in a cylinder. In their [study](#), published in the journal *Royal Society Open Science*, the group mimicked the effects of the moon's gravity on volunteer runners inside of a borrowed "wall of death."

Prior research has shown that when humans attempt to live in a low-gravity environment such as the ISS, or on the [moon](#), they lose muscle and bone mass, leading to [health problems](#). On the ISS, such loss is counteracted by exercise, such as running on a treadmill. But such exercise would not be sufficient for astronauts living for an extended period on the moon. In this new effort, the research team found that instead of running on a treadmill, astronauts on the moon could run inside a cylinder.

The idea for the cylinder came from the so-called "wall of death" used in side-show attractions at county fairs. Motorcycle riders appear to defy gravity by driving horizontally to the ground inside of a large cylinder. The feat is possible due to the outward centrifugal force on the motorcycle as it picks up speed and the friction of the tires against the sides of the cylinder.

A human would not be able to run fast enough to keep from falling, but

the researchers believed that doing so on the moon should be possible. To find out, they rented a cylinder from a local fair and placed a runner inside of it.

To keep the runner from falling, the researchers attached a bungee cord to a harness worn by a volunteer. The cord was tuned to simulate the moon's gravity. The two volunteers ran as they would while exercising and achieved average speeds of 6 meters per second.

The research team noted that the forces exerted by the volunteers against the walls of the cylinder were similar to those of a [runner](#) under normal conditions on Earth—more than enough to keep their muscles and bones from atrophying if they ran in the [cylinder](#) every day on the moon.

More information: Horizontal running inside circular walls of Moon settlements: a comprehensive countermeasure for low-gravity deconditioning?, *Royal Society Open Science* (2024). [DOI: 10.1098/rsos.231906](#).
royalsocietypublishing.org/doi/10.1098/rsos.231906

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