

## Space away from space

### *How can we re-create these conditions at home?*

Space clearly has advantages when it comes to performing certain experiments, but that doesn't come cheap. Launching something into orbit costs more than \$22,000 a kilogram, so it's vital that you are confident the mission is likely to work before launch. In some ways it is similar to the experiments done in the classroom or in a professional lab. Doing trial runs will help you to get used to the equipment before you start taking data and inform your final experimental protocol. However, doing trial runs in space is risky and expensive.

One way around this is to find or create places and environments on Earth that are as similar as possible to the space environment you want to explore. For example, Boulby International Subsurface Astrobiology Laboratory in Yorkshire, located in an old mine at a depth of 1.1 kilometres, is the UK's deepest microbiology laboratory. As part of their Mine Analogue Research programme, they test technologies designed to explore other planetary bodies.

Airbus Defence and Space in Stevenage have mocked up the Martian surface in an outbuilding to test the ExoMars rover, which will directly search for life on the Red Planet (see top image). We can also use places on Earth as **analogue sites** based on our knowledge of the conditions on other planets. The Dry Valleys of Antarctica, for example, are considered an ideal analogue for Mars. Astrobiologists have taken bacteria samples from the Dry Valleys and subjected them to the environmental conditions that would be similar to those found on the surface of Mars, such as high UV radiation, desiccation and low temperature. These Earthly experiments are important for understanding the survival of potential past or present life on Mars.



Antarctica Dry Valleys

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## ABOUT THIS RESOURCE

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