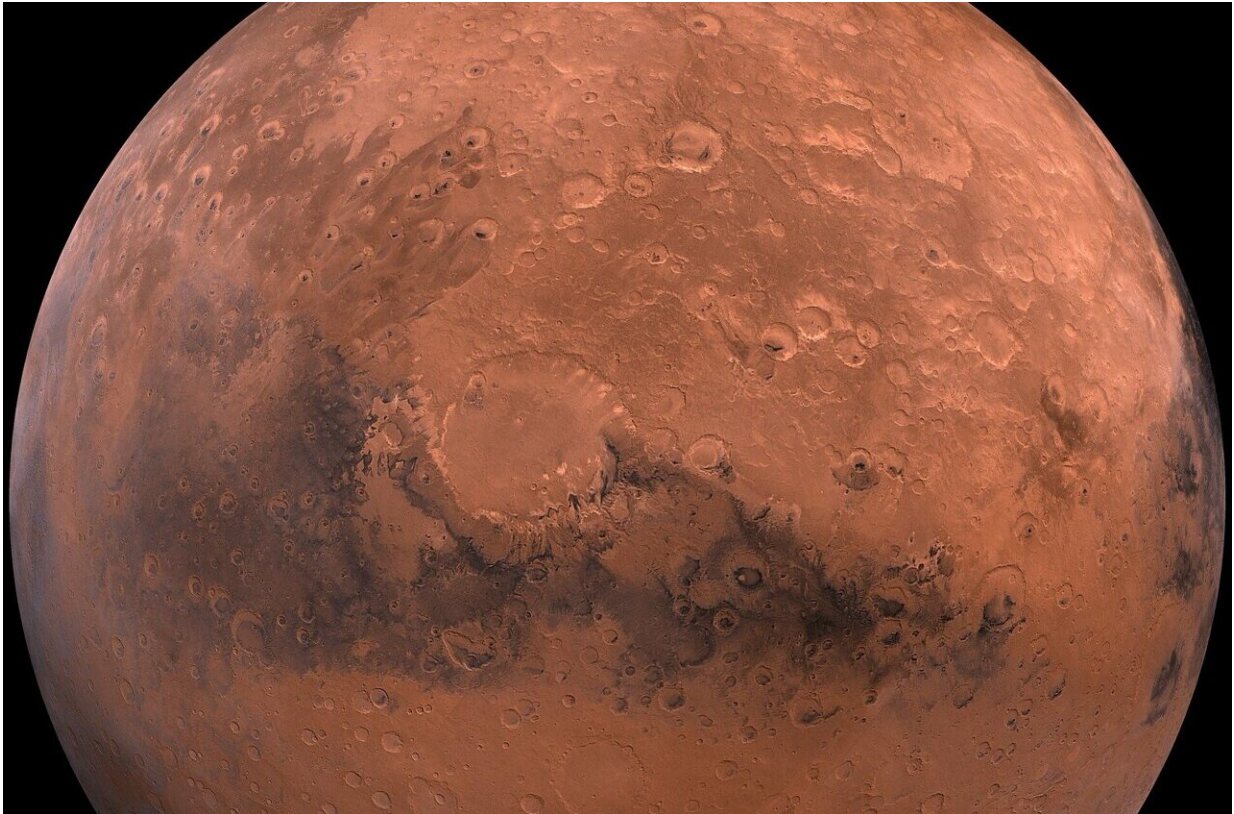


Video: Picking up lightsabers for Mars

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Credit: Pixabay/CC0 Public Domain

Detect, fetch and collect. A seemingly easy task is being tested to find the best strategy to collect samples on the martian surface, some 290 000 million km away from home.

Testing technologies for Mars exploration is part of the daily job of

Laura Bielenberg, an ESA graduate trainee for the Mars Sample Return campaign.

The [test](#) takes place at the rock-strewn recreation of the Red Planet at ESA's ESTEC technical center in Noordwijk, the Netherlands. The nickname of this test site is the 'Mars Yard' and is part of the Planetary Robotics Laboratory.

The tube is a replica of the sample caches that NASA's Perseverance rover is leaving on Mars hermetically sealed with precious martian samples inside. They are called RSTA, an acronym of Returnable Sample Tube Assembly, and to most people on Earth they look like lightsabers.

Laura is investigating sample tube collection strategies, from autonomous detection to pose estimation of sample tubes on Mars, with a testbed called the RABBIT (RAS Bread Boarding In-house Testbed).

The Sample Transfer Arm will need to load the tubes from the [martian surface](#) for delivery towards Earth. ESA's robotic arm will collect them from the Perseverance rover, and possibly others dropped by sample recovery helicopters as a backup.

Besides cameras and sensors, the team relies on [neural networks](#) to detect the tubes and estimate their pose. Inspired by the way the human brain works, neural networks mimic the way biological neurons signal to one another.

Provided by European Space Agency

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