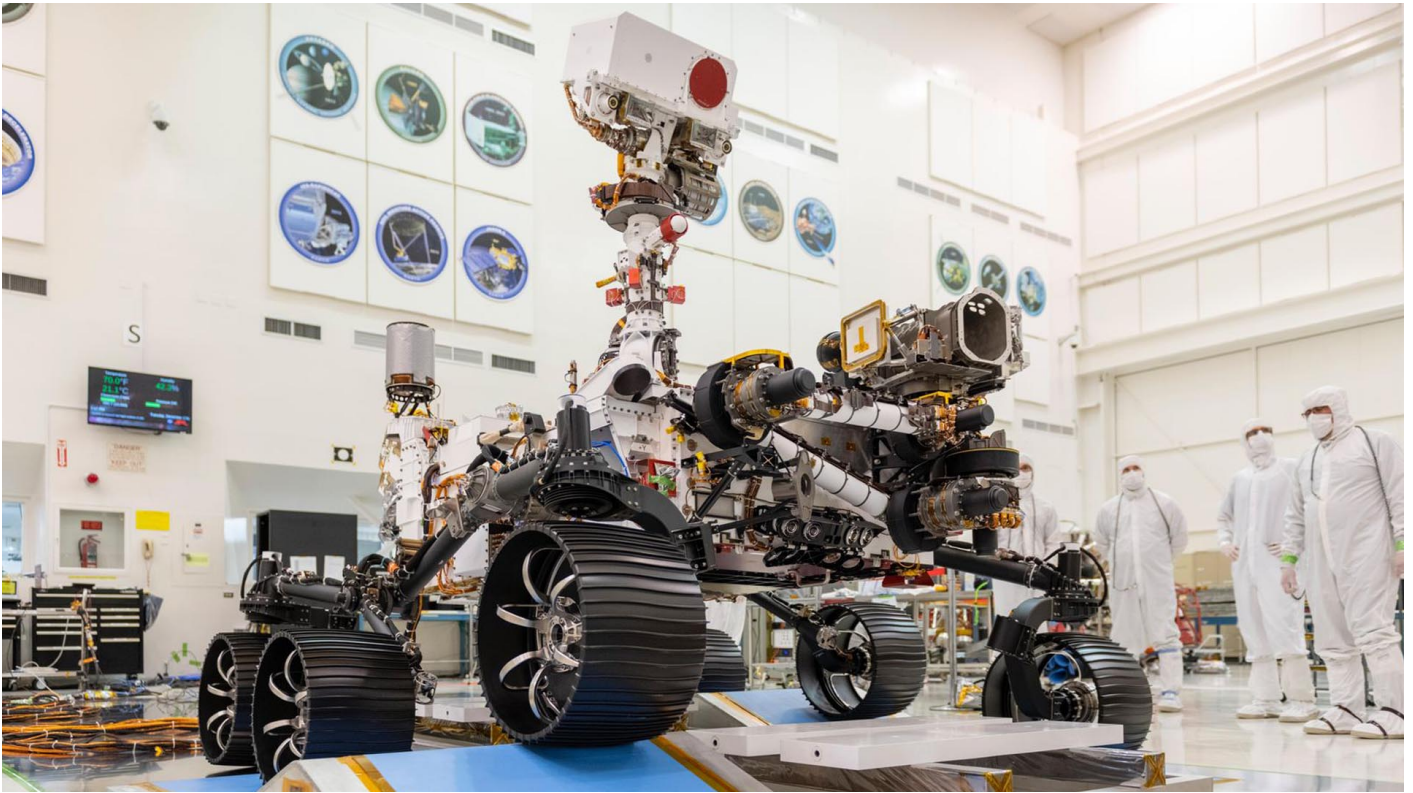


Tec engineer designs simulators to test Mars rover



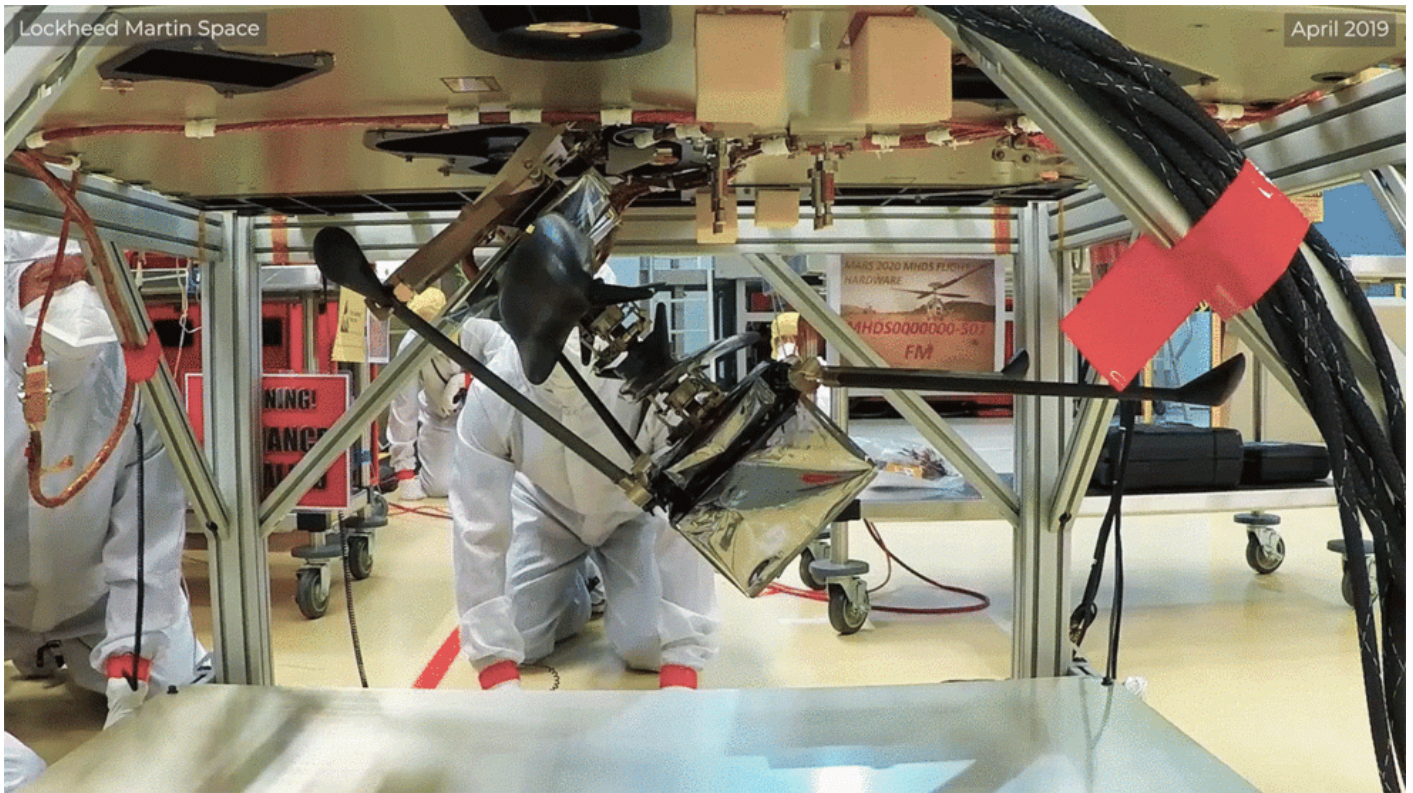
Mexican engineer and [Tec de Monterrey](#) graduate **Fernando Mier-Hicks** designed the **simulators** that have allowed [NASA](#) to test some of the Mars-bound [Perseverance](#) rover's functions.

The rover is recognized by the space agency as: *"the most complex robotic system that has ever flown into space"*, **which will be sent to the red planet at the end of July or in early August** as part of the [Mars 2020](#) mission.

Since joining **NASA's [Jet Propulsion Laboratory](#)** (JPL) just over three years ago, Fernando Mier-Hicks has been commissioned to **design equipment to test the robotic arm and the testing system** for the new rover.

A small helicopter was integrated into this system, which will be the **first flying object of its kind to cross the skies of another planet.**

Like its predecessors (*Pathfinder in 1996, Spirit and Opportunity in 2003, and Curiosity in 2011*), [Perseverance](#) will land on Mars, but this time **on an astrobiology mission** to look for microbial life and describe the climate and geology of the red planet.



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The robot, **which is similar in size** to a Mini Cooper and weighs **just over a ton**, has a collection and sealing (canning) system inside it **so it can take and keep samples**.

This mechanism was tested in JPL laboratories using an electronic **“ground support equipment”** simulator **developed by Fernando Mier-Hicks** and a team of engineers.

“It works like a small canning factory inside the robot: the rover’s external arm drills into a rock, collects the sample and passes it to an internal arm, which in turn puts this sample in a tube, seals it, and then stores it along with others,” he explained.



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During its mission on Mars, [Perseverance](#) is expected to collect up to **37 samples of rocky material**, which the robot will deposit in **the same or separate locations** so that, in a couple of years, another mission will **collect them**.

“We’ve created more than 30 of these simulation systems, which are basically like a rack of servers with a lot of electronics inside. We use these to activate the motors and measure the rover’s sensors in a very similar way to how the robot’s computer operates,” he said.

https://www.youtube.com/watch?time_continue=432&v=yIWyFX0uxoc&feature=emb_logo

“It works like a small canning factory inside the robot: it collects the sample, places it in a tube, seals it, and then stores it.”

The small helicopter, which has two propellers of approximately one meter in diameter and is similar in size to a softball, **was also tested**, using a gravity simulator (gravity offload).

This simulator was also developed by Fernando Mier-Hicks and his team, and will be sent to Mars inside [Perseverance](#).

The team of engineers had to take into **account that the atmosphere of Mars is 100 times thinner** than Earth's, and that the force of gravity of the red planet **is barely a third** of that on Earth.

https://www.youtube.com/watch?list=PLTiv_XWHnOZqCrMU2ppcLjRn1zIDkNx3q&v=d5ehz7pHprk&feature

“Mars has a very thin atmosphere through which it is more difficult to fly a helicopter: it would be like flying 30 kilometers above ground (on Earth), and a helicopter has never got that high,” said **Fernando Mier-Hicks**.

Perseverance is expected to land in Mars' Jezero crater on **February 18, 2021**. **NASA** and the **European Space Agency** are currently planning the two subsequent missions required to **return the samples collected to Earth**.

Recently, **Tec de Monterrey** and Fernando Mier-Hicks **promoted an exchange program** between **NASA-JPL** and Mexico, which received almost **500 applications** from students from the **School of Engineering and Sciences** at different campuses across the country.

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