WHAT IF I GET SICK?

On Mars the nearest doctor is an **eight-month** flight away. Good thing you'll have a **digital doc** built right into your space suit! **Vitaliti** is a medical monitor prototype being developed for future use. With a part that wraps around your neck and another that rests in your ear, the gizmo tracks your vital signs, including your **temperature** and **heart rate**. When it detects that you're getting sick, it **alerts you**, **diagnoses your illness** and then **recommends the right medicine**. Amazing!

A device worn around the neck checks heart rate and temperature

HOW DO I GET AROUND?

NASA first tested the Chariot rover in the Arizona desert

To explore the Red Planet you're going to have to leave the base. And that means taking **road trips that could last weeks**! The last space vehicle that could carry humans, the **Apollo Lunar Roving Vehicle** from the 1970s, was a day-tripping buggy with space for two astronauts but **no long-term supplies**. Enter **Chariot** (above).

"Chariot is kind of like a space campervan," explains NASA robotics engineer **Bill Bluethmann**. Behind its cockpit, the vehicle has storage space for **scientific equipment**, **benches for sleeping**, a **bathroom** and even a small **kitchen**. Anyone fancy a holiday?!

EARTH VS. MARS

EARTH		MARS
24 hours	LENGTH OF DAY	24 hours, 37 minutes
365 days	LENGTH OF YEAR	687 days
1	MOONS	2
15°C	AVERAGE TEMPERATURE	-62°C
12,756km	DIAMETER	6,794km

HOW DO I TALK TO PEOPLE BACK HOME?

When **Curiosity** – an unmanned rover on Mars at the moment – wants to talk to Earth, it beams radio waves to one of Earth's three **deep-space antennas**. But the mobile science lab only sends about **20 photos a day**, and communication is limited to **text messages**. "When you're on Mars and you want to talk to your family back on Earth, texts won't cut it," says NASA robotics engineer **Chaz Morantz**. Scientists hope to speed things up by using **lasers** to beam data between the Red Planet and Earth, making communication up to **100 times faster** than it is now. Mars astronauts will be able to send **unlimited snaps** of **Martian sunsets**, **selfies** and even **video messages**. What would you say in your first call home?!

WHAT (NOT) TO PACK

Space on the Orion is tight. What would you bring? Get inspired by these past astronauts' unusual carry-ons...

1965 **John Young** smuggled a **corned beef sandwich** into space.

1971 **Alan Shepard** brought his own **golf club** – and used it to smack a ball several kilometres in the Moon's low gravity.

2010 **Shannon Walker** carried aviator **Amelia Earhart's watch** on her trip to the International Space Station. Amelia wore the watch in 1932 while crossing the Atlantic Ocean by herself, the first female pilot to do so.

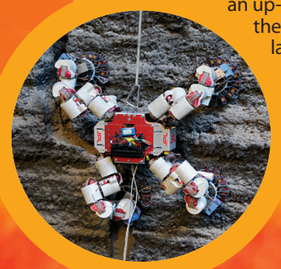
2012 Japan's **Satoshi Furukawa** carried **LEGO** to the International Space Station. He used the bricks to build a replica of the craft.

YOUR ROBOT SIDEKICKS

Not all jobs are fit for human astronauts. "Anything dull, dirty or dangerous, those are tasks for robots," says NASA robotics engineer Maria Bualat. Meet four astrobots in development...

LEMUR

With **claw-studded arms** inspired by **insect limbs**, LEMUR can safely scale the towering cliffs that cover Mars' surface. Its camera will get an up-close look at the planet's landmarks and it'll use a **zero-gravity drill** to take samples.



ASTROBEE

This beach-ball-sized **flying robot** will cruise around inside your spacecraft on the journey to Mars. **Astrobee** will **measure the air** to make sure the astronauts have enough **oxygen**, check the **spacecraft's parts** and **film astronauts** as they work so experts watching from Earth can offer advice.

ROBONAUT

When there's important science to do, you won't waste your time **fixing broken equipment**. That's a job for **Robonaut**. This person-shaped bot will be intelligent enough to carry out tasks without a human supervisor.

RASSOR

Hiding in Mars' soil are tiny particles of **ice**. That ice is made of **oxygen** and **hydrogen** – ingredients needed for **rocket fuel**. **RASSOR** will spin its barrel-shaped shovels to dig up dirt before carrying it back to camp for processing.

Don't miss *Space Weekend*, 12-13 November on the National Geographic Channel