
CURIOSITY

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(Music)

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00:00:04,000 --> 00:00:09,000
Hi I'm Ashwin Vasavada, project scientist for the Mars Science Laboratory mission

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and this is your special edition, third anniversary Curiosity Rover Report.

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It's a summer of milestones for Mars Exploration.

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Fifty years ago, Mariner 4 became the first spacecraft to take close-up pictures of Mars.

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39 years ago, the Viking 1 Lander became the first spacecraft to successfully land on the Red Planet.

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And now Curiosity celebrates 3 years on Mars -- operating well over a thousand Martian days.

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Since its arrival in August 2012, Curiosity has driven nearly eleven kilometers

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from its landing site to the foot of Mount Sharp within Gale Crater.

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The first year was spent traversing through ancient stream beds

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and exploring Yellowknife Bay, the site of an ancient lake.

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That's where Curiosity drilled samples from the lake floor

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to reveal mineral evidence of long-lived, fresh water.

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It also found carbon-containing organic molecules and nitrogen in a form usable to life.

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So if life ever were present on Mars, a site like Yellowknife Bay could sustain it.

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Then Curiosity put the pedal to the medal to get to Mount Sharp.

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That's when engineers noticed excessive wear on the rover's wheels.

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A lot of work went into understanding the cause and how to avoid it.

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But now we're confident that the wheels can take us where we need to go.

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It's been quite a road trip. Curiosity drilled at the Kimberley, drove through long valleys

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and took pictures of roadside geology before finally reaching the bedrock at the base of Mount Sharp.

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We spent several months studying these rocks at Pahrump Hills.

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The science team has been fascinated by all the signs of ancient water at Mount Sharp.

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It's likely that Gale Crater once hosted many rivers and lakes,

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carrying sediment to the crater floor that now forms the bottom layer of Mount Sharp.

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Now that we're climbing through the foothills of the mountain, the driving is challenging.

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The team relies on images from the Mars Reconnaissance Orbiter

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to find safe paths to interesting geologic targets.

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Getting to the current rover location at Marias Pass required a steep climb up a 6-meter hill.

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As we climbed the hill, Curiosity's ChemCam laser spectrometer

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noticed unusually high amounts of silica in nearby rocks.

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What might that mean? Were the environmental conditions friendly or hazardous to life?

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Could the silica have preserved organic molecules in the rocks for us to study today?

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We're hoping to find out.

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None of this would be possible without the dedicated team of rover engineers here at JPL.

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Every day that we operate Curiosity, a downlink team studies the information

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sent by the rover and makes sure it's healthy and ready to proceed with the next activities.

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Then an uplink team turns the desires of the scientists into sequences

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of commands that can be safely executed by the rover.

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It's an intense process that takes about nine hours every day.