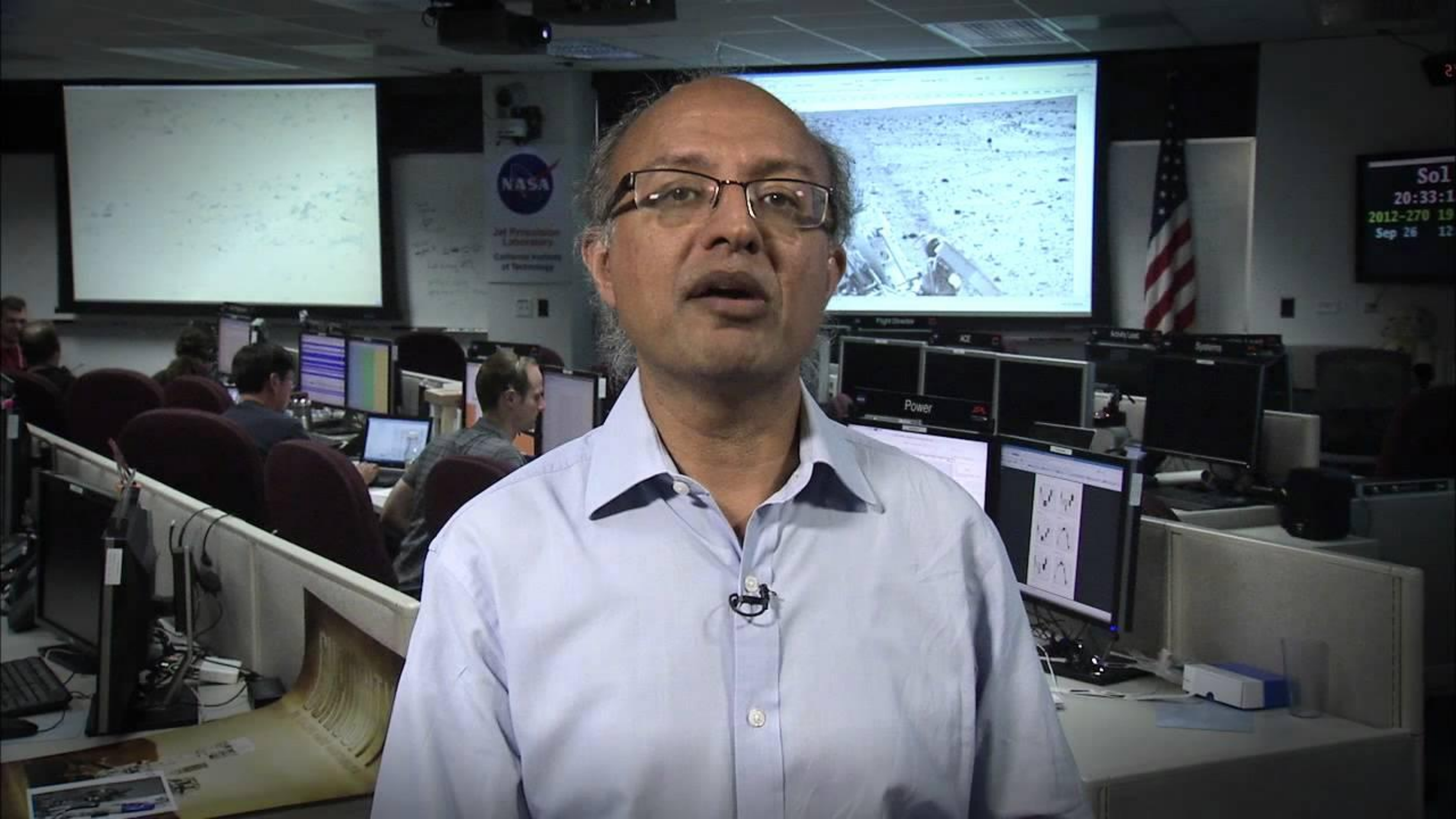
NASA
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1
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Hello, my name is Sanjeev Gupta and I am a long term planner for the Mars Curiosity rover.

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This is your Curiosity rover update. We've now been on Mars for almost 2 months and we have been

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witnessing the amazing new vistas of the never-before-seen Gale landscape taken with our wonderful cameras

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However, much of the science team have had their eyes and the rover's eyes firmly focused on the ground.

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On the drive from the Bradbury landing site to our current location

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we have been analyzing three really interesting outcrops that we have called Goulbourn, Link, and Hottah.

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If we look at the Hottah outcrop, we can see a distinct layer that has been tilted

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and eroded and this allows us to look at the cross-section through the layer.

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When we looked at the layer with our high-resolution Mastcam camera we found that it

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was comprised of sand grains and small pebbles that had become cemented to form a hard layer.

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Here you can see a pebble that is 3 cm in diameter; so smaller than a ping pong ball.

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This suggests that this layer is an ancient gravel deposit. The surprising thing is

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that when we looked at the pebbles closely, we discovered that many of them were quite well-rounded.

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This is very different to the many angular clasts that litter the surface.

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Here, you can see a rounded pebble from a riverbed on Earth.

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On Earth rounded pebbles are a common tell tale sign of rocks that have been transported by water.

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For example, in a river or a stream, as water flows over a riverbed, if the flow strength is great enough,

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the pebbles are lifted up into the flow or rolled along the riverbed and they become pounded and battered

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against each other and this causes them to become rounded through time. So what we think we might be seei

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here on Mars is an ancient riverbed with the pebble beds representing old stream deposits.

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The size of the pebbles tells us that these rocks could not have been transported by wind, so it seems

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clear they must've been transported by water. So how does a pebble deposit get to be here?

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If we look more broadly in Gale Crater, we can see that there is a prominent feature that geologists call an

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alluvial fan. Alluvial fans are cone-shaped deposits of gravel and sand that accumulate where streams exit

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mountains. In Gale crater, there is a 10 km long fan formed at the mouth of 30 m deep canyon that is

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derived from the crater rim. On the fan itself we can see evidence for multiple channels suggesting that the

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streambed direction changed through time. When we look at the location of the Curiosity landing site with

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respect to the alluvial fan, we see that the rover landed down stream of the fan. The rounded pebbles likely

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represent long distance transport down the alluvial fan. So this is really exiting news for the science team

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because this is the first time we are seeing gravel transported by water on the surface of Mars.