TRANSCRIPT: "Soaring over Mars"

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Title: Soaring Over Mars

Title: Candor Chasma

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The Mars Reconnaissance Orbiter has seen many places on the planet. One of the most interesting is one of the great canyon systems on Mars. This is a branch of that canyon system, called Candor Chasma. You can see the tortured ground that is there, the layers, the many buttes and mesas that poke up above this. The scale of these things is such that we're looking across a couple of miles of territory. There is no vertical exaggeration in this stereo image made by taking images at separate times on separate orbits. Some of these buttes extend up a football field in size. Fault systems that were produced by earthquakes, in this case Marsquakes, give us clues as to whether this is material that was eroded away or actually whether it was deposited and then eroded later. The stress patterns show us the canyon formed first, was filled with material and eroded away leaving these buttes, with the buttes being formed by more resistant rock at the top of the buttes - darker in these images.

Title: Mojave Crater

Rich Zurek: One of the questions we have about Mars is, where we see the effects of water on its surface, how did that water get there? It may have been different in different places. Did it erupt from underground as springs, for instance? Or did it fall from the sky in rainfall? And it may have been associated with events like impact craters. One of those impact craters is Mojave Crater. And here we're going to look at a perspective view that was formed from two images forming a stereo pair. As you can see, water ponded on the terraces. And then it overflowed and ran down to the next terrace. If you look at the rim of the crater, you see channels that run right up to the top. So these aren't springs. This must have been rainfall that carved this part of the planet.

Title: Nili Fossae

Rich Zurek: The Mars Reconnaissance Orbiter is able to look at not only the structure of the surface, its topography and shape, but also its composition. We're going to zoom in to an area called Nili Fossae that is very diverse. And that's shown here in false color. What we're looking at are the mineral signatures – fingerprints - that appear in reflected sunlight, although it's at wavelengths that our eyes are not sensitive to. Straight edges are the edges of the images that were taken; we don't have complete coverage. What we're most interested in here are the areas that are colored green. Those are areas in which carbonates are present. Carbonates indicate that here's an environment that could have been conducive to life, and if not life today, it could have preserved the signature of life that may have occurred in the past. That is, the organic molecules should also be preserved today, if they were ever produced on its surface. This very diverse area shows a complex mineral signature and also shows that there are many different kinds of water environments on the planet. So water was not uniform in

its activity. It may have persisted in some areas longer than in other areas. And its interaction with the rock has left us clues about what that ancient history was.

Title: Victoria Crater

Rich Zurek: One of the early images taken by the Mars Reconnaissance Orbiter was of Victoria Crater in order to help the Opportunity rover figure out which way to move around the crater as it looked for a way to get down inside. Here you see that image, taken from 180 miles above the surface of Mars. We're going to use that image to zoom in and see what it would look like from the rover's point of view, if it were on the edge of the crater looking out over it, and then match that with an image that was actually taken from the rover Opportunity on the Mars surface.

Title: Images are from the HiRISE instrument onboard the Mars Reconnaissance Orbiter. Final image is from the Mars Exploration Rover "Opportunity."

Title: NASA Jet Propulsion Laboratory, California Institute of Technology