

## Spirit's Triumphs on Mars

[00:00:01]Music

[00:00:11]Spirit was never designed to last this long. You know, the rover was never designed to go through Martian

[00:00:16]winter, and she went through three winters successfully. They were never designed to survive rover-killing

[00:00:23]dust storms, and yet Spirit survived several significant dust storms. Spirit climbed the 'Husband Hill,'

[00:00:29]so did Martian mountaineering, yet another thing it was never designed to do. So out of this rover that had

[00:00:35]a very limited scope of mission to begin with, we were able to do these magnificent adventures, and the rover

[00:00:43]was very successful on that. It's a testament to the people who designed and built the rover, and a testament

[00:00:48]to the people who operated the rover on the surface. The whole mission has had an amazing ability to turn what

[00:00:57]looks initially like it's going to be adversity into a great triumph. And Spirit in particular has really been

[00:01:06]known for this quality. One of the things that characterized Spirit on the surface of Mars, was the ability

[00:01:13]of that rover to turn lemons into lemonade. A couple years into the mission, Spirit's right front wheel broke.

[00:01:21]And we had to learn to drive the rover backwards. In fact, re-learn how to drive the rover. And we would drag

[00:01:27]that wheel. But out of that adversity came perhaps the most significant scientific discovery on the surface

[00:01:33]of Mars. We were hoping that Spirit would find evidence of past water history on Mars. And not only did Spirit

[00:01:38]find evidence of past water history on Mars, she found evidence of ph neutral water at 'Comanche Spur.'

[00:01:44]And she found evidence of hot water existing and kind of acting for long periods of time in the region near

[00:01:50]'Home Plate,' which we call 'Silica Valley.' So from a science perspective, Spirit smashed expectations.

[00:01:56]She did way better than we would ever possibly have hoped for. What Spirit has told us, is that Mars was at

[00:02:02]one time like the Earth, some three-and-a-half to four billion years ago. There was liquid water on the

[00:02:07]surface, there was a thicker atmosphere, there were warmer temperatures. And there were even sources of energy

[00:02:12]things like hot springs. These were all discoveries that Spirit has made. And this completely changes our

[00:02:17]thinking about Mars -- that Mars was in fact, at one time, a place that could have supported life.

[00:02:24]Spirit's legacy in terms of Mars exploration might be that she's made Mars a real place for us. She has helped

[00:02:30]to see what we would see if we were there. I also hope that she, again, has a broader legacy in terms of

## Spirit's Triumphs on Mars

[00:02:38]continuing to inspire people. To explore, to reach out beyond what they think they can accomplish.

[00:02:46]We always knew that there would come a time when one of the rovers wouldn't be there. That's the interesting

[00:02:51]thing, is that you do become very attached. And you think of these rovers really as part of your team and

[00:02:58]part of your family. For years now, I've been getting the question: well how are you going to feel when she's

[00:03:03]gone? And I've always had this image of, sort of the New Orleans jazz funeral procession, where there's

[00:03:11]some sadness, of course. Because Spirit has been, essentially my entire career at JPL working with these two

[00:03:18]rovers. There is just so much to celebrate. A life, if you will, that lasted beyond any expectation and

[00:03:27]and discovered wonderful things. So it's very bittersweet. I'm always going to be really proud of Spirit.

[00:03:32]You know, Spirit was my first Mars rover and if you've ever had a first car, you know a little bit about what

[00:03:39]that's like. I have loved Spirit from the early days when it seemed like nobody else did, and I still do,

[00:03:46]and she's always going to have a special place to me, in my heart. I was there with her at the very beginning.

[00:03:52]And she just took me, and everybody, on a terrific ride across the surface of Mars, showed us things that

[00:03:59]nobody had ever seen before in the history of humanity. She opened up that other world for us and made it

[00:04:05]possible for us to see it for the first time as if we were there. And I'm always going to be -- you know it's

[00:04:11]the kind of thing I grew up dreaming about when I was a kid. And to get a chance to do that for real, with my

[00:04:17]real life, you know, Spirit made that happen for me.

[00:04:20]And she's always going to be special to me just for that alone.