
Voice of:
Leslie Tamppari
Deputy Project Scientist, Mars Reconnaissance Orbiter

1
00:00:00,000 --> 00:00:03,000
Silent.

2
00:00:03,000 --> 00:00:08,000
Leslie Tamppari: The Mars Reconnaissance Orbiter--or MRO--that I work on has recently discovered

3
00:00:08,000 --> 00:00:13,000
the biggest impact crater in the solar system that's been confirmed with before-and-after imaging.

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00:00:13,000 --> 00:00:17,000
The diameter of this crater is about half the length of a football field.

5
00:00:17,000 --> 00:00:21,000
My colleague Bruce Cantor at Malin Space Science Systems discovered this

6
00:00:21,000 --> 00:00:27,000
by using the Mars Color Imager, or MARCI, which takes daily global weather maps.

7
00:00:27,000 --> 00:00:31,000
He observed a large dark spot that he wasn't sure had ever been there before.

8
00:00:31,000 --> 00:00:35,000
Searching through many of the images, Bruce was able to go back in time

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00:00:35,000 --> 00:00:41,000
to try to pin down if this spot was there on one day and not on another day.

10
00:00:41,000 --> 00:00:46,000
The spot was not there on March 27, 2012, but did show up on the next day.

11
00:00:46,000 --> 00:00:50,000
He suspected this spot to have been caused by an impact event.

12
00:00:50,000 --> 00:00:54,000
Using the Context Camera we were able to take higher-resolution images.

13
00:00:54,000 --> 00:00:58,000

And we were able to see two craters where that dark spot occurred.

14
00:00:58,000 --> 00:01:02,000
Comparing that image to an earlier image of that same area,

15
00:01:02,000 --> 00:01:07,000
we were able to see that the earlier image did not show the craters, and so these were fresh craters.

16
00:01:07,000 --> 00:01:13,000
We have an even higher-resolution camera--HiRISE--able to resolve features as small as a kitchen table.

17
00:01:13,000 --> 00:01:17,000
Using the HiRISE camera we were able to see a dozen or so smaller craters

18
00:01:17,000 --> 00:01:20,000
scattered near the two bigger ones.

19
00:01:20,000 --> 00:01:22,000
The small craters and the two larger ones may have been caused by

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00:01:22,000 --> 00:01:28,000
an impactor coming through the atmosphere and breaking into many pieces before hitting the ground.

21
00:01:28,000 --> 00:01:32,000
The HiRISE camera also revealed that there were many landslides in the area

22
00:01:32,000 --> 00:01:35,000
that are probably causing the darkening which was seen by the MARCI images.

23
00:01:35,000 --> 00:01:40,000
These landslides could have been caused by a shock wave from an explosion in the atmosphere

24
00:01:40,000 --> 00:01:43,000
or by the ground impacts that excavated the craters.

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00:01:43,000 --> 00:01:46,000
Between the Mars Reconnaissance Orbiter and the other Mars orbiters,

26
00:01:46,000 --> 00:01:51,000
we've discovered about 400 fresh impact craters confirmed with before and after imaging.

27
00:01:51,000 --> 00:01:56,000
However, this is the only time that we've seen a fresh impact using the MARCI weather camera

28
00:01:56,000 --> 00:02:01,000
and the only time that we've been able to pin down the time of impact

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00:02:01,000 --> 00:02:05,000
to such a small time window of one Martian day or 'sol.'

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00:02:05,000 --> 00:02:09,000
We're interested in understanding the current rate that impactors are hitting Mars and the other planets.

31
00:02:09,000 --> 00:02:13,000
And we also are interested in: what are they excavating from the subsurface?

32
00:02:13,000 --> 00:02:17,000
And in some cases they're excavating water ice.