
science

1
00:00:10,310 --> 00:00:07,349
the strange attraction of gale crater

2
00:00:13,030 --> 00:00:10,320
presented by science at nasa

3
00:00:15,509 --> 00:00:13,040
curiosity is about to go to mars the

4
00:00:17,830 --> 00:00:15,519
car-sized rover also known as the mars

5
00:00:20,870 --> 00:00:17,840
science lab is scheduled for launch in

6
00:00:23,189 --> 00:00:20,880
late november or early december 2011

7
00:00:25,429 --> 00:00:23,199
from the kennedy space center

8
00:00:27,189 --> 00:00:25,439
after an eight-month voyage to mars

9
00:00:29,109 --> 00:00:27,199
curiosity will land at the foot of a

10
00:00:30,710 --> 00:00:29,119
three-mile high mountain in a crater

11
00:00:32,870 --> 00:00:30,720
named gale

12
00:00:34,709 --> 00:00:32,880
it sounds a little odd a mountain in the

13
00:00:37,590 --> 00:00:34,719

middle of an impact crater

14
00:00:40,229 --> 00:00:37,600
wouldn't the impact have smashed it flat

15
00:00:42,069 --> 00:00:40,239
some scientists believe the 96 mile wide

16
00:00:44,709 --> 00:00:42,079
crater filled in with sediments over

17
00:00:46,470 --> 00:00:44,719
time and relentless martian winds carved

18
00:00:48,389 --> 00:00:46,480
a mountain in the center where it now

19
00:00:50,869 --> 00:00:48,399
stands nearly three times higher than

20
00:00:52,869 --> 00:00:50,879
the grand canyon is deep

21
00:00:54,869 --> 00:00:52,879
because of its history this strangely

22
00:00:56,869 --> 00:00:54,879
sculpted mountain is the ideal place for

23
00:00:59,990 --> 00:00:56,879
curiosity to conduct its mission of

24
00:01:02,790 --> 00:01:00,000
exploration into the red planet's past

25
00:01:05,509 --> 00:01:02,800
joy crisp msl deputy project scientist

26
00:01:07,910 --> 00:01:05,519
from nasa's jet propulsion lab explains

27
00:01:09,910 --> 00:01:07,920
this may be one of the thickest exposed

28
00:01:11,350 --> 00:01:09,920
sections of layered sedimentary rocks in

29
00:01:12,870 --> 00:01:11,360
the solar system

30
00:01:14,710 --> 00:01:12,880
the rock record preserved in those

31
00:01:17,510 --> 00:01:14,720
layers holds stories that are billions

32
00:01:19,830 --> 00:01:17,520
of years old stories about whether

33
00:01:21,510 --> 00:01:19,840
when and for how long mars might have

34
00:01:23,670 --> 00:01:21,520
been habitable

35
00:01:26,710 --> 00:01:23,680
today the red planet is a radiation

36
00:01:28,870 --> 00:01:26,720
drenched bitterly cold bleak world

37
00:01:30,870 --> 00:01:28,880
enormous dust storms explode across the

38
00:01:33,510 --> 00:01:30,880

barren landscape and darken martian

39
00:01:35,830 --> 00:01:33,520
skies for months at a time but data from

40
00:01:38,390 --> 00:01:35,840
mars reconnaissance orbiters suggest

41
00:01:41,190 --> 00:01:38,400
that mars once hosted vast lakes and

42
00:01:42,950 --> 00:01:41,200
flowing rivers gale crater and its

43
00:01:45,749 --> 00:01:42,960
mountain will tell this intriguing story

44
00:01:49,030 --> 00:01:45,759
says matthew golembeck mars exploration

45
00:01:50,870 --> 00:01:49,040
program landing site scientist from jpl

46
00:01:53,030 --> 00:01:50,880
the layers there chronicle mars

47
00:01:54,870 --> 00:01:53,040
environmental history

48
00:01:57,030 --> 00:01:54,880
in the gentle slopes around the mountain

49
00:01:59,350 --> 00:01:57,040
curiosity will prospect for organic

50
00:02:00,389 --> 00:01:59,360
molecules the chemical building blocks

51
00:02:02,310 --> 00:02:00,399
of life

52
00:02:04,630 --> 00:02:02,320
mars reconnaissance orbiter has found an

53
00:02:06,550 --> 00:02:04,640
intriguing signature of clay near the

54
00:02:08,869 --> 00:02:06,560
bottom of the mountain and sulfate

55
00:02:10,630 --> 00:02:08,879
minerals a little higher up

56
00:02:12,949 --> 00:02:10,640
both minerals are formed in the presence

57
00:02:15,190 --> 00:02:12,959
of water which increases potential for

58
00:02:16,869 --> 00:02:15,200
life-friendly environments

59
00:02:18,869 --> 00:02:16,879
all the types of aqueous minerals we've

60
00:02:22,070 --> 00:02:18,879
detected on mars to date can be found in

61
00:02:24,470 --> 00:02:22,080
this one location explains golembeck

62
00:02:26,790 --> 00:02:24,480
clay settles slowly in water and forms

63
00:02:29,430 --> 00:02:26,800

little platelets that conform around

64
00:02:30,949 --> 00:02:29,440
things hardening over time and encasing

65
00:02:32,869 --> 00:02:30,959
them in casts

66
00:02:34,869 --> 00:02:32,879
clay could seal organics off from the

67
00:02:37,350 --> 00:02:34,879
outside environment much like a

68
00:02:39,990 --> 00:02:37,360
preserved dinosaur bones on earth

69
00:02:42,309 --> 00:02:40,000
if organics ever existed on mars they

70
00:02:44,790 --> 00:02:42,319
could be preserved in the clay

71
00:02:47,030 --> 00:02:44,800
even on planet earth teeming with life

72
00:02:48,790 --> 00:02:47,040
finding billion-year-old well-preserved

73
00:02:50,790 --> 00:02:48,800
organics is difficult

74
00:02:53,030 --> 00:02:50,800
but curiosity will find them if they're

75
00:02:54,790 --> 00:02:53,040
present in the samples it takes

76
00:02:56,550 --> 00:02:54,800
the rover is equipped with the most

77
00:02:58,790 --> 00:02:56,560
advanced suite of instruments for

78
00:02:59,910 --> 00:02:58,800
scientific studies ever sent to the mars

79
00:03:01,350 --> 00:02:59,920
surface

80
00:03:03,350 --> 00:03:01,360
when these are brought to bear on gale

81
00:03:05,830 --> 00:03:03,360
crater and its mysteriously layered

82
00:03:07,270 --> 00:03:05,840
mountain who knows what discoveries will