



science @ NASA

1
00:00:09,830 --> 00:00:07,349
the sleepy hollows of mercury presented

2
00:00:12,070 --> 00:00:09,840
by science at nasa

3
00:00:14,549 --> 00:00:12,080
the word sleepy hollow have been steeped

4
00:00:16,230 --> 00:00:14,559
in mystery ever since the 19th century

5
00:00:18,310 --> 00:00:16,240
when washington irving wrote about the

6
00:00:20,870 --> 00:00:18,320
meeting of ichabod crane and the

7
00:00:21,910 --> 00:00:20,880
headless horseman in a secluded european

8
00:00:23,830 --> 00:00:21,920
clan

9
00:00:25,589 --> 00:00:23,840
of course that was fiction

10
00:00:26,550 --> 00:00:25,599
on the planet mercury the hollows are

11
00:00:28,550 --> 00:00:26,560
real

12
00:00:30,950 --> 00:00:28,560
orbiting mercury nasa's messenger

13
00:00:33,590 --> 00:00:30,960

spacecraft has just discovered strange

14

00:00:36,389 --> 00:00:33,600

hollows as steeped in mystery as the one

15

00:00:38,549 --> 00:00:36,399

irving wrote about so many years ago

16

00:00:41,110 --> 00:00:38,559

high-resolution images reveal thousands

17

00:00:43,030 --> 00:00:41,120

of peculiar depressions at a variety of

18

00:00:45,510 --> 00:00:43,040

longitudes and latitudes

19

00:00:49,029 --> 00:00:45,520

ranging in size from 60 feet to more

20

00:00:49,990 --> 00:00:49,039

than a mile across and 60 to 120 feet

21

00:00:52,310 --> 00:00:50,000

deep

22

00:00:54,069 --> 00:00:52,320

no one knows how they got there

23

00:00:56,389 --> 00:00:54,079

the hollows of mercury were a major

24

00:00:58,549 --> 00:00:56,399

surprise says david blewett science team

25

00:01:00,709 --> 00:00:58,559

member from the johns hopkins university

26

00:01:02,229 --> 00:01:00,719

applied physics laboratory

27

00:01:04,630 --> 00:01:02,239

we've been thinking of mercury as a

28

00:01:06,710 --> 00:01:04,640

relic a place that's not changing much

29

00:01:08,310 --> 00:01:06,720

anymore but the hollows appear to be

30

00:01:10,630 --> 00:01:08,320

much younger than the craters in which

31

00:01:12,310 --> 00:01:10,640

they are found and that means mercury's

32

00:01:13,910 --> 00:01:12,320

surface is still evolving in a

33

00:01:15,670 --> 00:01:13,920

surprising way

34

00:01:17,109 --> 00:01:15,680

mars reconnaissance orbiter spotted

35

00:01:19,910 --> 00:01:17,119

similar depressions in the carbon

36

00:01:22,550 --> 00:01:19,920

dioxide ice at mars south pole giving

37

00:01:25,510 --> 00:01:22,560

that surface a swiss cheese appearance

38

00:01:28,469 --> 00:01:25,520

but on mercury they're found in rock and

39

00:01:30,069 --> 00:01:28,479

often have bright interiors and halos

40

00:01:32,550 --> 00:01:30,079

we've never seen anything quite like

41

00:01:34,069 --> 00:01:32,560

this on a rocky surface he says

42

00:01:36,469 --> 00:01:34,079

if you could stand in one of these

43

00:01:38,950 --> 00:01:36,479

sleepy hollows on mercury's surface

44

00:01:42,550 --> 00:01:38,960

you'd find yourself like ichabod crane

45

00:01:44,789 --> 00:01:42,560

in a quiet still haunting place with a

46

00:01:46,550 --> 00:01:44,799

jet black sky above your head

47

00:01:48,630 --> 00:01:46,560

there's essentially no atmosphere on

48

00:01:50,389 --> 00:01:48,640

mercury says blewitt so the hollows

49

00:01:51,350 --> 00:01:50,399

could not have been carved by wind or

50

00:01:53,510 --> 00:01:51,360

rain

51

00:01:55,910 --> 00:01:53,520

other forces must be at work

52

00:01:58,310 --> 00:01:55,920

as the planet closest to the sun mercury

53

00:01:59,590 --> 00:01:58,320

is exposed to fierce heat and extreme

54

00:02:01,590 --> 00:01:59,600

space weather

55

00:02:02,789 --> 00:02:01,600

blewitt believes these factors may play

56

00:02:04,870 --> 00:02:02,799

a role

57

00:02:06,550 --> 00:02:04,880

a key clue he says is that many of the

58

00:02:09,270 --> 00:02:06,560

hollows are associated with central

59

00:02:10,710 --> 00:02:09,280

mounds or mountains inside mercury's

60

00:02:12,790 --> 00:02:10,720

impact craters

61

00:02:14,790 --> 00:02:12,800

these so-called peak rings are thought

62

00:02:17,110 --> 00:02:14,800

to be made of material forced up from

63

00:02:18,070 --> 00:02:17,120

the depths by the impact that formed the

64

00:02:20,150 --> 00:02:18,080

crater

65

00:02:22,309 --> 00:02:20,160

excavated material could be unstable

66

00:02:24,150 --> 00:02:22,319

when it finds itself suddenly exposed at

67

00:02:25,990 --> 00:02:24,160

mercury's surface

68

00:02:28,470 --> 00:02:26,000

certain minerals for example those that

69

00:02:30,710 --> 00:02:28,480

contain sulfur and other volatiles would

70

00:02:33,670 --> 00:02:30,720

be easily vaporized by the onslaught of

71

00:02:36,470 --> 00:02:33,680

heat solar wind and micrometeoroids that

72

00:02:38,710 --> 00:02:36,480

mercury experiences on a daily basis

73

00:02:41,430 --> 00:02:38,720

messenger has found mercury unexpectedly

74

00:02:43,589 --> 00:02:41,440

rich in sulfur explains blewitt

75

00:02:45,910 --> 00:02:43,599

perhaps the sulfur is vaporizing leaving

76

00:02:47,509 --> 00:02:45,920

just the other minerals and therefore

77

00:02:48,710 --> 00:02:47,519

weakening the rock and making it

78

00:02:50,550 --> 00:02:48,720

spongier

79

00:02:53,509 --> 00:02:50,560

then the rock would crumble and erode

80

00:02:55,350 --> 00:02:53,519

more readily forming these depressions

81

00:02:57,190 --> 00:02:55,360

more data from messenger and further

82

00:02:58,869 --> 00:02:57,200

study by the mission science team could

83

00:03:01,270 --> 00:02:58,879

reveal the answer

84

00:03:03,589 --> 00:03:01,280

meanwhile blewett wonders what other

85

00:03:05,350 --> 00:03:03,599

surprises does mercury hold

86

00:03:07,750 --> 00:03:05,360

the sleepy hollows of the innermost

87

00:03:10,229 --> 00:03:07,760

planet may be just the beginning