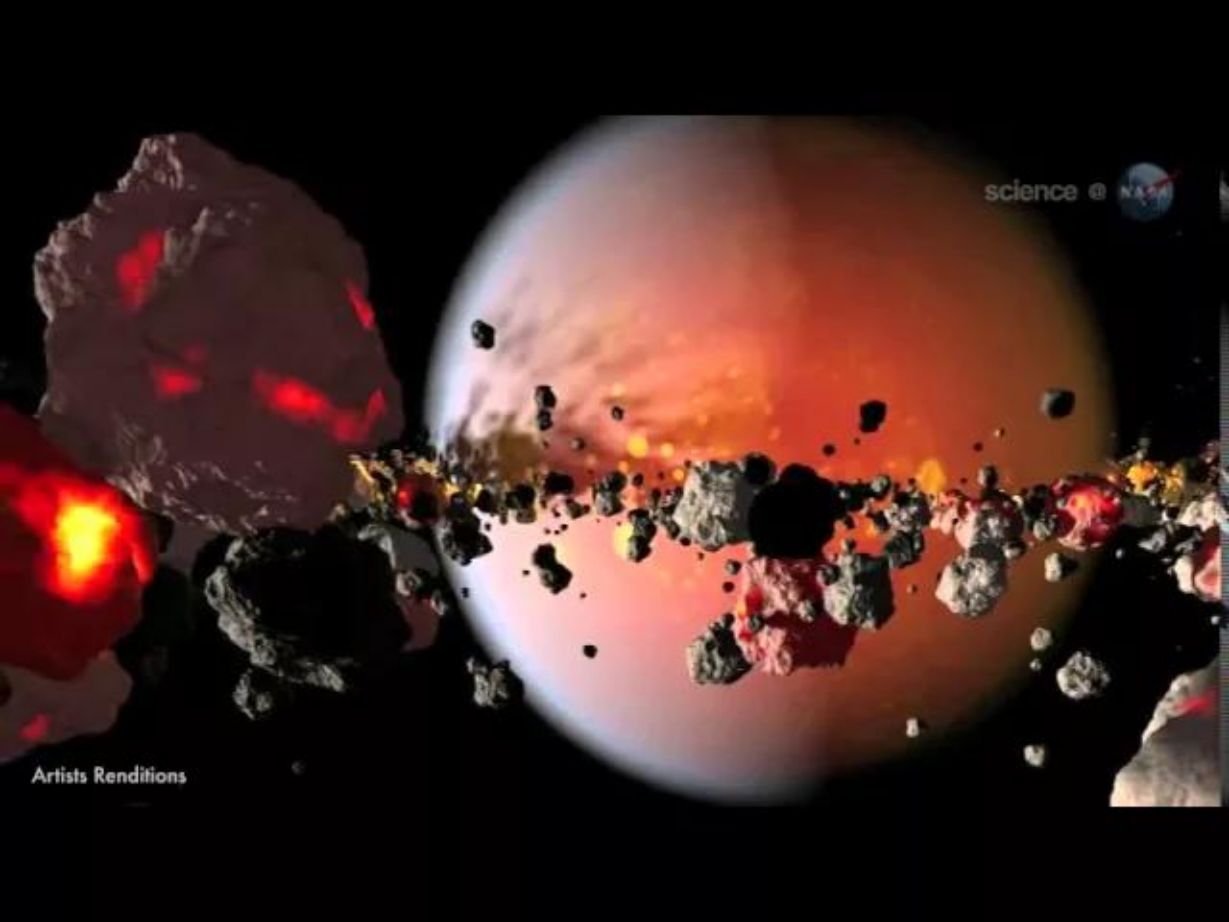


science @ NASA

Artists Renditions



1
00:00:10,790 --> 00:00:07,510
did earth have two moons

2
00:00:12,789 --> 00:00:10,800
presented by science at nasa

3
00:00:14,709 --> 00:00:12,799
nothing stirs the soul of poets and

4
00:00:17,430 --> 00:00:14,719
lovers like the sight of a full moon

5
00:00:19,830 --> 00:00:17,440
rising on a warm autumn night

6
00:00:21,429 --> 00:00:19,840
nothing that is except the sight of two

7
00:00:23,189 --> 00:00:21,439
moons rising

8
00:00:25,670 --> 00:00:23,199
if a paper published recently in the

9
00:00:27,750 --> 00:00:25,680
journal nature is right two moons once

10
00:00:30,390 --> 00:00:27,760
graced the night skies of earth

11
00:00:31,830 --> 00:00:30,400
the idea has not been proven but it is

12
00:00:33,190 --> 00:00:31,840
drawing the serious attention of

13
00:00:35,430 --> 00:00:33,200

researchers

14

00:00:37,030 --> 00:00:35,440

it's an intriguing idea says david smith

15

00:00:38,310 --> 00:00:37,040

of the massachusetts institute of

16

00:00:39,990 --> 00:00:38,320

technology

17

00:00:41,750 --> 00:00:40,000

and it would be a way to explain one of

18

00:00:42,709 --> 00:00:41,760

the great mysteries of the earth moon

19

00:00:45,590 --> 00:00:42,719

system

20

00:00:48,310 --> 00:00:45,600

the moon is strangely asymmetrical

21

00:00:50,869 --> 00:00:48,320

the moon's near side facing us

22

00:00:52,790 --> 00:00:50,879

is dominated by vast smooth seas of

23

00:00:54,950 --> 00:00:52,800

ancient hardened lava

24

00:00:57,029 --> 00:00:54,960

the moon's far side on the other hand is

25

00:00:58,709 --> 00:00:57,039

marked by mountainous highlands

26

00:01:00,790 --> 00:00:58,719

researchers have long struggled to

27

00:01:02,310 --> 00:01:00,800

explain why the two sides of the moon

28

00:01:04,630 --> 00:01:02,320

are so different

29

00:01:07,350 --> 00:01:04,640

and the two moon theory introduced by

30

00:01:09,510 --> 00:01:07,360

planetary scientists martin jotzi and

31

00:01:11,910 --> 00:01:09,520

eric asforg of the university of

32

00:01:13,109 --> 00:01:11,920

california at santa cruz is the latest

33

00:01:15,190 --> 00:01:13,119

attempt

34

00:01:17,670 --> 00:01:15,200

nasa's grail mission launched from the

35

00:01:19,830 --> 00:01:17,680

kennedy space center on september 10th

36

00:01:21,350 --> 00:01:19,840

could help unravel the mystery

37

00:01:23,590 --> 00:01:21,360

smith is the deputy principal

38

00:01:27,190 --> 00:01:23,600

investigator for grail which stands for

39

00:01:29,670 --> 00:01:27,200

gravity recovery and interior laboratory

40

00:01:32,310 --> 00:01:29,680

grail consists of two spacecraft that

41

00:01:34,390 --> 00:01:32,320

will orbit the moon in tandem precisely

42

00:01:36,069 --> 00:01:34,400

mapping the moon's gravitational field

43

00:01:38,149 --> 00:01:36,079

and thus revealing how the moon's

44

00:01:40,310 --> 00:01:38,159

interior is layered

45

00:01:42,310 --> 00:01:40,320

among other things this could test the

46

00:01:44,310 --> 00:01:42,320

two moon theory

47

00:01:46,469 --> 00:01:44,320

most scientists believe that when a

48

00:01:48,310 --> 00:01:46,479

mars-sized object crashed into our

49

00:01:50,789 --> 00:01:48,320

planet about four and a half billion

50

00:01:53,030 --> 00:01:50,799

years ago the resulting debris cloud

51
00:01:55,270 --> 00:01:53,040
coalesced to form the moon

52
00:01:58,069 --> 00:01:55,280
jetsey and asphalt say that the debris

53
00:02:00,310 --> 00:01:58,079
cloud actually formed two moons

54
00:02:02,230 --> 00:02:00,320
a second smaller chunk of debris landed

55
00:02:04,550 --> 00:02:02,240
in just the right orbit to pace the

56
00:02:06,709 --> 00:02:04,560
bigger moon around earth

57
00:02:08,869 --> 00:02:06,719
normally such moons accrete into a

58
00:02:10,710 --> 00:02:08,879
single body shortly after formation

59
00:02:12,630 --> 00:02:10,720
explains smith but the new theory

60
00:02:14,309 --> 00:02:12,640
proposes that the second moon ended up

61
00:02:15,990 --> 00:02:14,319
at one of the lagrange points in the

62
00:02:17,510 --> 00:02:16,000
earth moon system

63
00:02:19,589 --> 00:02:17,520

lagrange points are a bit like

64

00:02:22,229 --> 00:02:19,599

gravitational fly traps

65

00:02:24,630 --> 00:02:22,239

they can hold an object for a long time

66

00:02:26,550 --> 00:02:24,640

but not necessarily forever

67

00:02:28,390 --> 00:02:26,560

the second moon eventually worked its

68

00:02:29,510 --> 00:02:28,400

way out and collided with its bigger

69

00:02:31,110 --> 00:02:29,520

sister

70

00:02:33,190 --> 00:02:31,120

the collision occurred at such low

71

00:02:34,229 --> 00:02:33,200

velocity that the impact did not form a

72

00:02:37,270 --> 00:02:34,239

crater

73

00:02:39,030 --> 00:02:37,280

instead the smaller moon went splat

74

00:02:40,229 --> 00:02:39,040

forming the contemporary far side

75

00:02:44,309 --> 00:02:40,239

highlands

76

00:02:46,630 --> 00:02:44,319

lost moon's remains

77

00:02:48,550 --> 00:02:46,640

when grail examines the lunar far side

78

00:02:50,309 --> 00:02:48,560

will it find evidence of a long-lost

79

00:02:51,670 --> 00:02:50,319

moon splattered across the ancient grey

80

00:02:53,350 --> 00:02:51,680

landscape

81

00:02:55,190 --> 00:02:53,360

for answers to this and other

82

00:02:57,110 --> 00:02:55,200

soul-stirring questions as the grail