
BENNU
MPC DESIGNATION
101955

1
00:00:05,590 --> 00:00:03,429
in late 2018 as nasa's osiris-rex

2
00:00:07,990 --> 00:00:05,600
spacecraft neared its target bennu the

3
00:00:10,390 --> 00:00:08,000
asteroid grew in detail from a few tiny

4
00:00:12,549 --> 00:00:10,400
pixels to an incredibly high resolution

5
00:00:14,549 --> 00:00:12,559
image osiris-rex confirmed the

6
00:00:16,390 --> 00:00:14,559
asteroid's basic shape which was

7
00:00:18,790 --> 00:00:16,400
originally observed in 1999 by

8
00:00:21,349 --> 00:00:18,800
ground-based radar at arcebo observatory

9
00:00:22,870 --> 00:00:21,359
what scientists didn't expect was just

10
00:00:24,630 --> 00:00:22,880
how rough and boulder-filled the

11
00:00:26,710 --> 00:00:24,640
asteroid would turn out to be while it

12
00:00:28,630 --> 00:00:26,720
can be difficult to fully grasp bennu's

13
00:00:30,070 --> 00:00:28,640

unfamiliar surface it's helpful to

14
00:00:32,389 --> 00:00:30,080
understand the scale of what you're

15
00:00:34,630 --> 00:00:32,399
seeing here in this image the brightest

16
00:00:36,310 --> 00:00:34,640
boulder is the length of a horse

17
00:00:38,310 --> 00:00:36,320
and the large boulder in this image is

18
00:00:40,069 --> 00:00:38,320
the width of a soccer field

19
00:00:42,470 --> 00:00:40,079
another challenge for the mission is the

20
00:00:44,630 --> 00:00:42,480
asteroid's small size and weak gravity

21
00:00:46,470 --> 00:00:44,640
this means that osiris-rex needs to fly

22
00:00:47,990 --> 00:00:46,480
daringly close to the surface in order

23
00:00:50,549 --> 00:00:48,000
to enter into orbit

24
00:00:52,389 --> 00:00:50,559
with its orbital a phase osiris-rex

25
00:00:54,229 --> 00:00:52,399
successfully entered the closest ever

26
00:00:55,590 --> 00:00:54,239
orbit for a spacecraft

27
00:00:56,709 --> 00:00:55,600
setting a guinness world record in the

28
00:00:57,510 --> 00:00:56,719
process

29
00:00:59,510 --> 00:00:57,520
then

30
00:01:01,270 --> 00:00:59,520
six months later it beat its own record

31
00:01:02,790 --> 00:01:01,280
during its orbital v phase and

32
00:01:04,950 --> 00:01:02,800
approached to within a few hundred

33
00:01:07,190 --> 00:01:04,960
meters of the rocky surface because

34
00:01:09,270 --> 00:01:07,200
osiris-rex flew so closely over the

35
00:01:11,350 --> 00:01:09,280
surface during orbital b the team was

36
00:01:13,350 --> 00:01:11,360
able to map the topography and shape of

37
00:01:15,270 --> 00:01:13,360
bennu better than we have our own moon

38
00:01:17,990 --> 00:01:15,280

in addition to mapping asteroid bennu

39
00:01:20,230 --> 00:01:18,000
osiris-rex plans to collect and return a

40
00:01:22,310 --> 00:01:20,240
sample back to earth to do that the

41
00:01:24,469 --> 00:01:22,320
spacecraft will carefully tag the

42
00:01:26,550 --> 00:01:24,479
surface of bennu the osiris-rex team has

43
00:01:29,590 --> 00:01:26,560
selected four possible sample sites for

44
00:01:31,510 --> 00:01:29,600
the mission osprey kingfisher

45
00:01:33,670 --> 00:01:31,520
nightingale

46
00:01:35,749 --> 00:01:33,680
and sandpiper

47
00:01:37,270 --> 00:01:35,759
the spacecraft has been closely imaging

48
00:01:39,429 --> 00:01:37,280
these sites from different angles to

49
00:01:40,390 --> 00:01:39,439
select the best touchdown spot for

50
00:01:41,910 --> 00:01:40,400
ranks

51
00:01:43,749 --> 00:01:41,920
what was originally envisioned as a

52
00:01:46,630 --> 00:01:43,759
smooth and easy touchdown on bennu

53
00:01:48,789 --> 00:01:46,640
surface has become a complex endeavor to

54
00:01:51,109 --> 00:01:48,799
tag a small crowded space on the

55
00:01:52,830 --> 00:01:51,119
asteroid an area no larger than a few

56
00:01:54,550 --> 00:01:52,840
parking spots by

57
00:01:56,550 --> 00:01:54,560
mid-2020

58
00:01:58,870 --> 00:01:56,560
the osiris-rex team has already pushed

59
00:02:01,109 --> 00:01:58,880
the boundaries of scientific exploration

60
00:02:02,789 --> 00:02:01,119
going from ground-based radar images all

61
00:02:05,109 --> 00:02:02,799
the way to being a few hundred meters

62
00:02:06,950 --> 00:02:05,119
from the asteroid surface and is now