



1  
00:00:00,000 --> 00:00:03,866  
In late 2018, as NASA's  
OSIRIS-REx spacecraft neared its

2  
00:00:03,866 --> 00:00:07,966  
target, Bennu, the asteroid grew  
in detail from a few tiny pixels

3  
00:00:07,966 --> 00:00:12,000  
to an incredibly hi-resolution  
image. OSIRIS-REx confirmed the

4  
00:00:12,000 --> 00:00:15,633  
asteroid's basic shape, which  
was originally observed in 1999

5  
00:00:15,633 --> 00:00:19,233  
by ground-based radar at Arecibo  
Observatory. What scientists

6  
00:00:19,233 --> 00:00:22,833  
didn't expect was just how rough  
and boulder-filled the asteroid

7  
00:00:22,833 --> 00:00:25,733  
would turn out to be. While it  
can be difficult to fully grasp

8  
00:00:25,733 --> 00:00:29,133  
Bennu's unfamiliar surface, it's  
helpful to understand the scale

9  
00:00:29,133 --> 00:00:31,900  
of what you're seeing here. In  
this image, the brightest

10  
00:00:31,900 --> 00:00:35,266  
boulder is the length of a horse  
and the large boulder in this

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00:00:35,266 --> 00:00:38,833

image is the width of a soccer field. Another challenge for the

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00:00:38,833 --> 00:00:42,233

mission is the asteroid's small size and weak gravity. This

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00:00:42,233 --> 00:00:45,100

means that OSIRIS-REx needs to fly daringly close to the

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00:00:45,100 --> 00:00:49,300

surface in order to enter into orbit. With its orbital A phase,

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00:00:49,300 --> 00:00:52,433

OSIRIS-REx successfully entered the closest-ever orbit for a

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00:00:52,433 --> 00:00:56,200

spacecraft, setting a Guinness World Record in the process.

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00:00:56,200 --> 00:00:59,366

Then, 6 months later, it beat its own record during its

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00:00:59,366 --> 00:01:02,633

orbital B phase and approached to within a few hundred meters

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00:01:02,633 --> 00:01:06,500

of the rocky surface. Because OSIRIS-REx flew so closely over

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00:01:06,500 --> 00:01:09,466

the surface during orbital B, the team was able to map the

21  
00:01:09,466 --> 00:01:12,533  
topography and shape of Bennu  
better than we have our own

22  
00:01:12,533 --> 00:01:16,066  
Moon. In addition to mapping  
Bennu, OSIRIS-REx plans to

23  
00:01:16,066 --> 00:01:19,033  
collect and return a sample of  
the asteroid back to Earth. To

24  
00:01:19,033 --> 00:01:22,333  
do that, the spacecraft will  
carefully tag the surface of

25  
00:01:22,333 --> 00:01:26,266  
Bennu. Last December, the team officially selected

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00:01:26,266 --> 00:01:31,266  
sample site Nightingale as the TAG location for OSIRIS-REx

27  
00:01:31,266 --> 00:01:35,700  
Over the past year, the spacecraft has  
been closely imaging this site

28  
00:01:35,700 --> 00:01:39,466  
and conducting rehearsals in preparation for sample collection.

29  
00:01:39,466 --> 00:01:42,333  
What was originally  
envisioned as a smooth and easy

30  
00:01:42,333 --> 00:01:46,033  
touchdown on Bennu's surface,  
has become a complex endeavor to

31  
00:01:46,033 --> 00:01:50,166  
tag a small, crowded space on

the asteroid – an area no larger

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00:01:50,166 --> 00:01:55,433

than a few parking spots. The OSIRIS-REx team has

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00:01:55,433 --> 00:01:58,600

already pushed the boundaries of  
scientific exploration, going

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00:01:58,600 --> 00:02:01,466

from ground-based radar images  
all the way to being a few