1
00:00:00,000 --> 00:00:07,340
[music throughout] A historic moment is on the horizon for NASA’s OSIRIS-REx mission

2
00:00:07,340 --> 00:00:13,580
On October 20, the OSIRIS-REx spacecraft will journey to asteroid Bennu’s

3
00:00:13,580 --> 00:00:16,683
Bennu’s boulder-strewn surface and briefly touchdown to gather a sample –

4
00:00:16,683 --> 00:00:20,487
something NASA has never done before.

5
00:00:20,487 --> 00:00:25,625
Right now, you are watching OSIRIS-REx preparing for its descent

6
00:00:25,625 --> 00:00:31,998
to sample site Nightingale, a dark crater near Bennu’s north pole, that you can see below you now.

7
00:00:31,998 --> 00:00:38,071
Site Nightingale is one of the only areas on Bennu that holds

8
00:00:38,071 --> 00:00:41,808
enough fine-grained material for the spacecraft to safely access.

9
00:00:41,808 --> 00:00:47,247
The crater is only 66 ft (20 meters) in diameter, or about the size of a tennis court

10
00:00:47,247 --> 00:00:54,087
The Nightingale site itself is only 26 ft (8 m) wide, nearly the width of 3 parking spaces.

11
00:00:54,087 --> 00:00:59,492
From orbit departure, to the steep descent, to the back-away burn,

12
00:00:59,492 --> 00:01:04,697
the spacecraft will perform the entire sample collection sequence autonomously.

13
00:01:04,697 --> 00:01:10,937

To safely touch the site, the spacecraft has to position itself for the Touch-And-Go sample collection maneuver

14
00:01:10,937 --> 00:01:16,810
OSIRIS-REx will first stretch out its sampling arm from the folded, parked position.

15
00:01:16,810 --> 00:01:23,883
Then, it will slowly move its solar panels into the “Y-wing” configuration – as you see right now.

16
00:01:23,883 --> 00:01:27,720
Placing the solar panels up and away from the asteroid’s surface during touchdown.

17
00:01:27,720 --> 00:01:34,527
This configuration also places the spacecraft’s center of gravity directly over the TAGSAM collector head,

18
00:01:34,527 --> 00:01:39,699
which is the only part of the spacecraft that will contact Bennu’s surface during the sample collection event.

19
00:01:39,699 --> 00:01:48,775
As OSIRIS-REx descends to Nightingale, it will approach the site and fly over building-sized boulders scattered

20
00:01:48,775 --> 00:01:53,780
The tallest one you see is about the same height as a three-story building.

21
00:01:53,780 --> 00:02:00,487
The spacecraft will spend approximately 22 minutes deeply descending to the rocky surface…

22
00:02:00,487 --> 00:02:16,202
While OSIRIS-REx descends, take a look around sample site Nightingale.

23
00:02:16,202 --> 00:02:21,107
Remember, OSIRIS-REx is aiming to tag a spot no larger than a few parking spaces.

24
00:02:21,107 --> 00:02:26,179
In between these boulders are small patches of relatively clear surface –

25
00:02:26,179 --> 00:02:32,051
enough to allow OSIRIS-REx to collect at least 60 grams of pristine asteroid sample.

26
00:02:32,051 --> 00:02:37,390
With just meters to go, OSIRIS-REx is now ready to collect a sample.

27
00:02:37,390 --> 00:02:44,998
Once the sample collector head senses contact with Bennu’s surface, it will fire a small puff of compressed nitr

28
00:02:44,998 --> 00:02:53,006
to kick up debris and capture pieces of the asteroid into the collector head – an event that lasts just a few seco

29
00:02:53,006 --> 00:03:05,985
OSIRIS-REx will then fire its thrusters to slowly back-away from the surface and navigate to a safe distance aw