1
00:00:00,000 --> 00:00:04,629
[music throughout] Over 200 million miles away from Earth,

2
00:00:04,629 --> 00:00:06,631
NASA’s OSIRIS-REx spacecraft

3
00:00:06,631 --> 00:00:11,177
is preparing for an ambitious sample collection attempt at asteroid Bennu.

4
00:00:11,177 --> 00:00:15,140
Before it makes its approach to the rocky surface,

5
00:00:15,140 --> 00:00:19,019
let’s take a look back at some of the incredible firsts for this mission,

6
00:00:19,019 --> 00:00:21,980
which almost seem like something out of a Hollywood movie…

7
00:00:21,980 --> 00:00:26,735
This is the first asteroid sample return mission for NASA,

8
00:00:26,735 --> 00:00:29,112
and it could be the largest sample returned from space

9
00:00:29,112 --> 00:00:32,657
since the Apollo astronauts brought Moon samples back to Earth.

10
00:00:32,657 --> 00:00:35,243
While getting set to grab a sample, OSIRIS-REx

11
00:00:35,243 --> 00:00:38,663
has set not one, but two Guinness World Records.

12
00:00:38,663 --> 00:00:41,708
Its first for the smallest ever body orbited

13
00:00:41,708 --> 00:00:45,211

and its second for the closest orbit of a spacecraft.

14
00:00:45,211 --> 00:00:48,757
This tight orbit has brought the spacecraft so close to Bennu

15
00:00:48,757 --> 00:00:52,218
that OSIRIS-REx's onboard cameras and laser altimeter

16
00:00:52,218 --> 00:00:57,724
have been able to image and characterize the asteroid's surface and shape better than Earth,

17
00:00:57,724 --> 00:00:58,683
our own moon,

18
00:00:58,683 --> 00:01:01,352
or any other celestial body.

19
00:01:01,352 --> 00:01:07,859
It has imaged Bennu down to 5 centimeter per pixel resolution,

20
00:01:07,859 --> 00:01:13,782
providing us with an unprecedented view into this rocky, and boulder-filled world.

21
00:01:13,782 --> 00:01:19,704
With 28 on-board thrusters, OSIRIS-REx is one of the most maneuverable spacecrafts.

22
00:01:19,704 --> 00:01:23,583
This allows it to carefully and precisely descend to a spot on Bennu

23
00:01:23,583 --> 00:01:26,252
that is no larger than a few parking spaces.

24
00:01:26,252 --> 00:01:29,798
There have certainly been some unexpected twists along the way;

25
00:01:29,798 --> 00:01:32,926
however, OSIRIS-REx has capitalized on these moments…

26
00:01:32,926 --> 00:01:35,970
Right after arriving at the asteroid, OSIRIS-REx imaged

27
00:01:35,970 --> 00:01:38,973
rocky ejecta that has been bursting off Bennu.

28
00:01:38,973 --> 00:01:42,102
This is the first timewe have been able to observe the entire lifecycle

29
00:01:42,102 --> 00:01:44,437
of a natural satellite ejecting off an object,

30
00:01:44,437 --> 00:01:48,024
entering into orbit, and returning back to the surface.

31
00:01:48,024 --> 00:01:50,610
Because of Bennu’s extremely rocky surface,

32
00:01:50,610 --> 00:01:53,905
the team needed to adapt the spacecraft’s navigation method

33
00:01:53,905 --> 00:01:58,201
to an optical approach known as Natural Feature Tracking, or NFT.

34
00:01:58,201 --> 00:02:00,829
This is the first time this approach has been used in space –

35
00:02:00,829 --> 00:02:05,500
and it will allow OSIRIS-REx to steer itself down to collect a sample from Bennu.