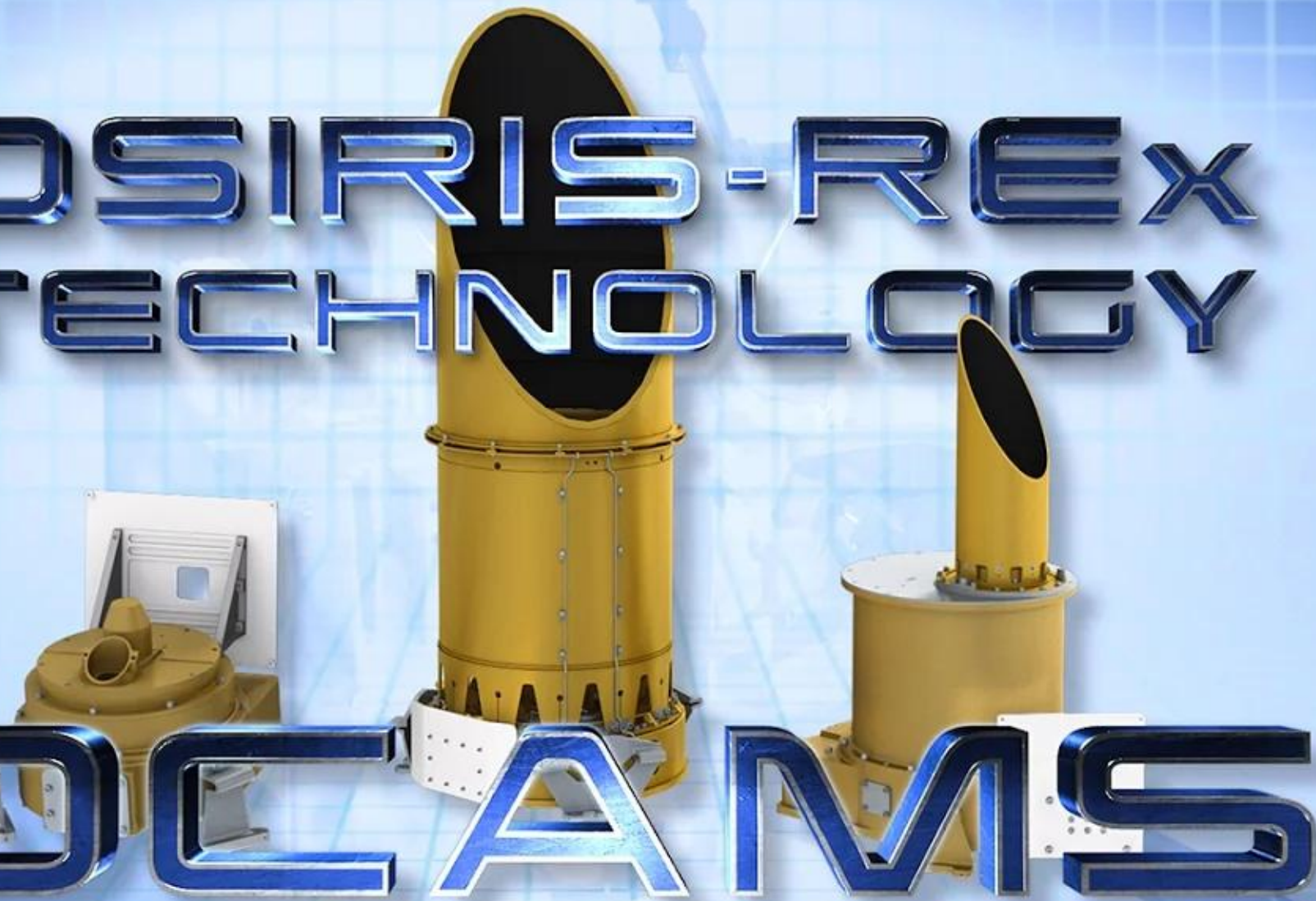
OSIRIS-REx TECHNOLOGY



OCAMS

1
00:00:00,033 --> 00:00:03,704
[Music]

2
00:00:05,772 --> 00:00:09,409
How does one spacecraft image an
asteroid from as far away as

3
00:00:09,409 --> 00:00:13,914
a million kilometers, or as
close as just a few meters?

4
00:00:13,914 --> 00:00:20,220
Accomplishing this task is the
job of OCAMS: the OSIRIS-REx
camera suite.

5
00:00:20,220 --> 00:00:23,557
NASA's OSIRIS-REx mission is
headed to near-Earth asteroid

6
00:00:23,557 --> 00:00:26,760
Bennu, a remnant from the
dawn of the solar system.

7
00:00:26,760 --> 00:00:31,865
OCAMS sits on the OSIRIS-REx
instrument deck, which will face
Bennu during orbit.

8
00:00:31,865 --> 00:00:34,768
It consists of three cameras
built by the University of

9
00:00:34,768 --> 00:00:39,506
Arizona, each designed to
provide the mission with a
unique perspective.

10
00:00:39,506 --> 00:00:42,476
PolyCam is a reflecting

telescope with an eight-inch

11
00:00:42,476 --> 00:00:45,445
mirror and a narrow field of
view, which will acquire both

12
00:00:45,445 --> 00:00:48,515
long-range and
close-up images of Bennu.

13
00:00:48,515 --> 00:00:52,819
MapCam is a medium-angle camera,
which will map Bennu in color.

14
00:00:52,819 --> 00:00:56,023
SamCam is a wide-angle
camera that will record the most

15
00:00:56,023 --> 00:00:58,325
crucial moment of the
OSIRIS-REx mission.

16
00:01:01,361 --> 00:01:04,731
OSIRIS-REx will spend nearly
two years traveling from Earth

17
00:01:04,731 --> 00:01:07,334
before approaching Bennu in
2018.

18
00:01:07,334 --> 00:01:10,504
PolyCam will be the first
instrument to spot the asteroid,

19
00:01:10,504 --> 00:01:14,007
as a faint speck of light up
to two million kilometers away.

20
00:01:14,007 --> 00:01:17,511
As OSIRIS-REx approaches Bennu,

it will switch from navigating

21
00:01:17,511 --> 00:01:21,214
by using radar ranging from the
Earth to using OCAMS to refine

22
00:01:21,214 --> 00:01:26,787
the asteroid's position and to
ensure a smooth transition to
proximity operations.

23
00:01:26,787 --> 00:01:30,590
Over the next year, the OCAMS
suite will scan Bennu at various

24
00:01:30,590 --> 00:01:34,728
resolutions, providing
global maps and close-up images.

25
00:01:34,728 --> 00:01:37,864
MapCam will use its color
filters for spectral imaging,

26
00:01:37,864 --> 00:01:41,068
revealing clues about the
asteroid's composition through

27
00:01:41,068 --> 00:01:44,338
subtle changes in its
color and brightness.

28
00:01:44,338 --> 00:01:48,976
In 2019, OSIRIS-REx will make a
series of close passes of Bennu,

29
00:01:48,976 --> 00:01:54,414
allowing PolyCam to image
portions of the surface with
sub-centimeter resolution.

30

00:01:54,414 --> 00:01:57,551
These images will prepare
OSIRIS-REx for its most

31
00:01:57,551 --> 00:02:02,222
important task, which will be
documented by the wide-angle
SamCam.

32
00:02:02,222 --> 00:02:05,926
After more than a year in orbit,
OSIRIS-REx will slowly approach

33
00:02:05,926 --> 00:02:09,196
Bennu's surface to grab a
sample of the asteroid.

34
00:02:09,196 --> 00:02:14,301
SamCam will capture the event in
a series of rapid-fire images.

35
00:02:14,301 --> 00:02:17,104
This visual record will
help scientists understand the

36
00:02:17,104 --> 00:02:19,740
context of the
returned material.

37
00:02:19,740 --> 00:02:24,344
In 2023, OSIRIS-REx will deliver
its sample of Bennu to Earth,

38
00:02:24,344 --> 00:02:28,982
where scientists will study
the sample for decades to come.

39
00:02:28,982 --> 00:02:33,420
OSIRIS-REx is investigating
asteroid Bennu, and OCAMS will

40
00:02:33,420 --> 00:02:36,623
provide the first close-up look
at this ancient remnant of the