1
00:00:00,020 --> 00:00:09,260
[music]

2
00:00:09,280 --> 00:00:14,730
If you want to study a piece of the early solar system in a lab on Earth, what do you do?

3
00:00:14,750 --> 00:00:17,880
To better understand the evolution of our solar system,

4
00:00:17,900 --> 00:00:24,180
NASA is sending the Origins Spectral Interpretation Resource Identification Security Regolith Explorer,

5
00:00:24,200 --> 00:00:28,700
or OSIRIS-REx, to study a Near Earth asteroid called Bennu.

6
00:00:28,720 --> 00:00:33,480
OSIRIS-REx will launch in 2016 and arrive at Bennu in 2018,

7
00:00:33,500 --> 00:00:37,980
where it will spend over a year surveying the asteroid in unprecedented detail,

8
00:00:38,000 --> 00:00:42,980
determining its chemical makeup, mineralogy, and geologic history.

9
00:00:43,000 --> 00:00:48,100
The OSIRIS-REx payload contains several instruments for remote sensing observations,

10
00:00:48,120 --> 00:00:55,250
including high resolution cameras, LIDAR, and X-ray, visible light, and infrared spectrometers.

11
00:00:55,270 --> 00:01:00,300
Knowing the physical properties of Bennu will help scientists to refine its orbit over time,

12
00:01:00,320 --> 00:01:04,350
including deviations caused by heating and cooling from sunlight,

13
00:01:04,370 --> 00:01:08,360

and it will allow them to pick a site for OSIRIS-REx's primary mission:

14
00:01:08,380 --> 00:01:12,180
retrieving a sample of the asteroid for study on Earth.

15
00:01:12,200 --> 00:01:17,410
In 2019, OSIRIS-REx will deploy its Touch And Go Sample Acquisition Mechanism,

16
00:01:17,430 --> 00:01:21,320
or TAGSAM, and slowly approach the sample site.

17
00:01:21,340 --> 00:01:25,610
When the TAGSAM touches the surface it will release a burst of nitrogen gas,

18
00:01:25,630 --> 00:01:29,630
causing loose rocks and soil to flow into the collector.

19
00:01:29,650 --> 00:01:35,780
Since Bennu may be rich in organic material or water left over from the formation of the solar system,

20
00:01:35,800 --> 00:01:40,630
sampling it could reveal whether the building blocks of life were present at that time,

21
00:01:40,650 --> 00:01:44,870
perhaps providing clues to the origins of life itself.

22
00:01:44,890 --> 00:01:51,030
After moving away from the surface, OSIRIS-REx will perform a spin maneuver to measure the mass of the sa

23
00:01:51,050 --> 00:01:58,280
then it will carefully stow the TAGSAM head inside the Sample Return Capsule and prepare for the journey ba

24
00:01:58,300 --> 00:02:02,780
Upon arriving home in 2023, OSIRIS-REx will release the sample,

25
00:02:02,800 --> 00:02:08,830
giving us a piece of the ancient solar system that will be studied for decades to come.

26
00:02:08,850 --> 00:02:14,970
OSIRIS-REx is a joint project of the University of Arizona's Lunar and Planetary Laboratory,

27
00:02:14,990 --> 00:02:18,480
NASA's Goddard Space Flight Center in Greenbelt, Maryland,

28
00:02:18,500 --> 00:02:22,030
and Lockheed Martin Space Systems in Denver, Colorado.