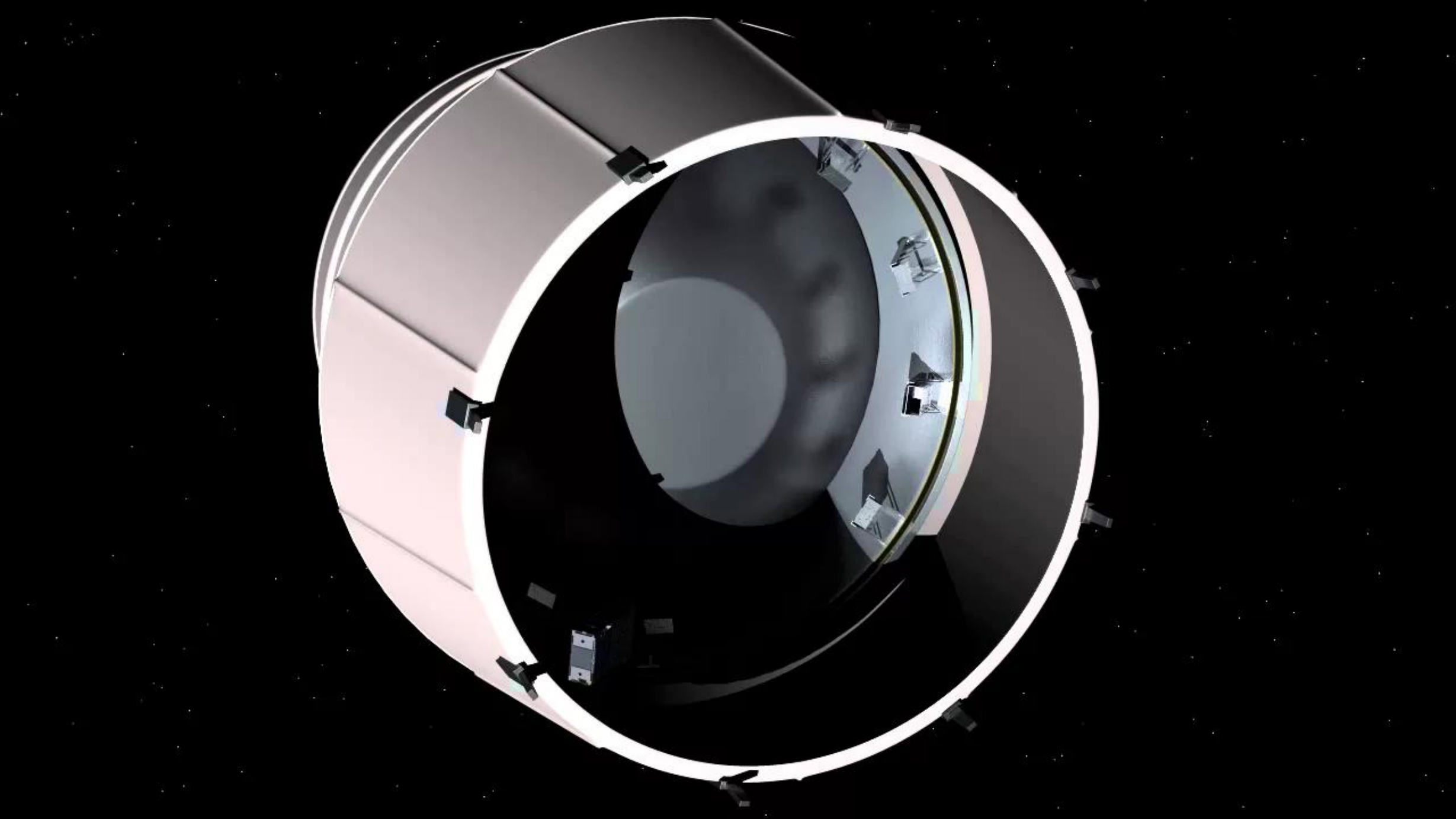

1
00:00:06,778 --> 00:00:12,216
T minus ten, nine, eight, seven

2
00:00:12,251 --> 00:00:18,072
six, five,four, three, two, one

3
00:00:18,107 --> 00:00:21,376
And liftoff!

4
00:00:21,411 --> 00:00:28,544
Music

5
00:00:28,579 --> 00:00:29,824
When NASA's new launch system,

6
00:00:29,859 --> 00:00:31,552
SLS, has its first flight,

7
00:00:31,587 --> 00:00:33,784
known as Exploration Mission One

8
00:00:33,819 --> 00:00:35,272
it will carry the unmanned Orion

9
00:00:35,307 --> 00:00:37,472
spacecraft on a voyage to the

10
00:00:37,507 --> 00:00:39,439
moon and back. It will also be

11
00:00:39,474 --> 00:00:40,919
carrying multiple small

12
00:00:40,954 --> 00:00:43,064
spacecraft as secondary payloads

13
00:00:43,099 --> 00:00:45,400

SLS is the largest and most

14
00:00:45,435 --> 00:00:47,240
powerful American rocket since

15
00:00:47,275 --> 00:00:49,072
the Saturn V and will eventually

16
00:00:49,107 --> 00:00:50,784
send humans farther into space

17
00:00:50,819 --> 00:00:53,248
than ever before.Two minutes

18
00:00:53,283 --> 00:00:55,081
into the flight the twin solid

19
00:00:55,116 --> 00:00:56,856
rocket boosters will burn out.

20
00:00:56,891 --> 00:00:59,080
About 10 minutes after the Orion

21
00:00:59,115 --> 00:01:00,968
and it service module escape the

22
00:01:01,003 --> 00:01:02,808
pull of Earths gravity, the two

23
00:01:02,843 --> 00:01:04,328
will disconnect and Orion will

24
00:01:04,363 --> 00:01:07,048
proceed toward the moon. On the

25
00:01:07,083 --> 00:01:09,080
SLS second stage, housed within

26
00:01:09,115 --> 00:01:11,176
the multi stage adapter, are

27
00:01:11,211 --> 00:01:13,120
multiple small spacecraft known

28
00:01:13,155 --> 00:01:15,552
as cubesats. Cubesats are about

29
00:01:15,587 --> 00:01:18,016
the size of a large shoebox and

30
00:01:18,051 --> 00:01:20,025
weigh less than 30 pounds each.

31
00:01:20,060 --> 00:01:22,920
SLS is carrying these cubesats

32
00:01:22,955 --> 00:01:24,904
piggyback, which will give them

33
00:01:24,939 --> 00:01:27,416
a low cost ride into deep space.

34
00:01:27,451 --> 00:01:29,008
Once Orion is a safe distance

35
00:01:29,043 --> 00:01:30,728
away, the small payloads will

36
00:01:30,763 --> 00:01:32,840
begin to be deployed. The

37
00:01:32,875 --> 00:01:34,328
dispensers on the adapter ring

38
00:01:34,363 --> 00:01:36,392

completely isolate the cubesats

39
00:01:36,427 --> 00:01:38,920
from the SLS, they require no

40
00:01:38,955 --> 00:01:40,424
power and operate completely

41
00:01:40,459 --> 00:01:42,568
independently of the rocket.

42
00:01:42,603 --> 00:01:44,663
One of these cubesats is called

43
00:01:44,698 --> 00:01:46,599
Near Earth Asteroid Scout, or

44
00:01:46,634 --> 00:01:48,136
NEA Scout, and it will

45
00:01:48,171 --> 00:01:49,680
demonstrate a new capability

46
00:01:49,715 --> 00:01:51,880
for exploration, low-cost

47
00:01:51,915 --> 00:01:54,176
reconnaissance of asteroids.

48
00:01:54,211 --> 00:01:56,592
Asteroids to which we may one

49
00:01:56,627 --> 00:01:59,136
day send human explorers.Shortly

50
00:01:59,171 --> 00:02:00,799
after the NEA scout cubesat is

51
00:02:00,834 --> 00:02:03,008
ejected from the SLS, solar

52
00:02:03,043 --> 00:02:04,856
panels will deploy to provide

53
00:02:04,891 --> 00:02:07,168
the spacecraft with power. Next

54
00:02:07,203 --> 00:02:08,880
will be unfurled an 85 square

55
00:02:08,915 --> 00:02:10,760
meter solar sail. The sail, the

56
00:02:10,795 --> 00:02:13,103
length of a school bus, reflects

57
00:02:13,138 --> 00:02:14,607
sunlight and is the spacecraft's

58
00:02:14,642 --> 00:02:16,848
propulsion system. This is the

59
00:02:16,883 --> 00:02:18,568
largest solar sail ever

60
00:02:18,603 --> 00:02:20,408
deployed by the United States.

61
00:02:20,443 --> 00:02:22,760
NEA scout will fly by moon which

62
00:02:22,795 --> 00:02:24,808
will help send it on its way to

63
00:02:24,843 --> 00:02:26,736

the target asteroid. The key

64
00:02:26,771 --> 00:02:27,961
to enabling this low-cost

65
00:02:27,996 --> 00:02:29,552
reconnaissance capability, is

66
00:02:29,587 --> 00:02:31,120
the propulsion system that will

67
00:02:31,155 --> 00:02:32,568
enable the NEA Scout to go

68
00:02:32,603 --> 00:02:34,376
from near earth space to a

69
00:02:34,411 --> 00:02:35,832
deep space rendezvous with

70
00:02:35,867 --> 00:02:37,464
an asteroid. Using the

71
00:02:37,499 --> 00:02:39,192
sunlight pressure NEA Scout

72
00:02:39,227 --> 00:02:40,833
will continuously alter its

73
00:02:40,868 --> 00:02:42,640
trajectory as it moves toward

74
00:02:42,675 --> 00:02:45,440
its asteroid rendezvous.

75
00:02:45,475 --> 00:02:46,976
Sunlight particles or photons,

76
00:02:47,011 --> 00:02:48,512
which in this case behave

77
00:02:48,547 --> 00:02:50,496
like tiny ping-pong balls as

78
00:02:50,531 --> 00:02:52,040
they bounce off of the sail,

79
00:02:52,075 --> 00:02:53,520
push on the sail as they

80
00:02:53,555 --> 00:02:54,968
reflect from it. And since the

81
00:02:55,003 --> 00:02:56,792
sun is always shining, the

82
00:02:56,827 --> 00:02:58,944
thrust is continuous. However

83
00:02:58,979 --> 00:03:00,672
it is very small, on the order

84
00:03:00,707 --> 00:03:02,080
of an ounce of force per

85
00:03:02,115 --> 00:03:04,344
football field of area. Once

86
00:03:04,379 --> 00:03:06,576
at the asteroid, NEA Scout's

87
00:03:06,611 --> 00:03:08,352
onboard camera will image its

88
00:03:08,387 --> 00:03:10,512

surface in detail, answering

89
00:03:10,547 --> 00:03:11,952
many questions about the

90
00:03:11,987 --> 00:03:13,568
asteroid’s composition and

91
00:03:13,603 --> 00:03:15,591
history. Exploration Mission One

92
00:03:15,626 --> 00:03:16,943
will serve as a proving

93
00:03:16,978 --> 00:03:18,672
ground for the integrated Orion

94
00:03:18,707 --> 00:03:20,488
spacecraft and the Space Launch

95
00:03:20,523 --> 00:03:22,576
System. In addition, it will

96
00:03:22,611 --> 00:03:24,040
provide an enabling capability

97
00:03:24,075 --> 00:03:25,888
for flying interplanetary small