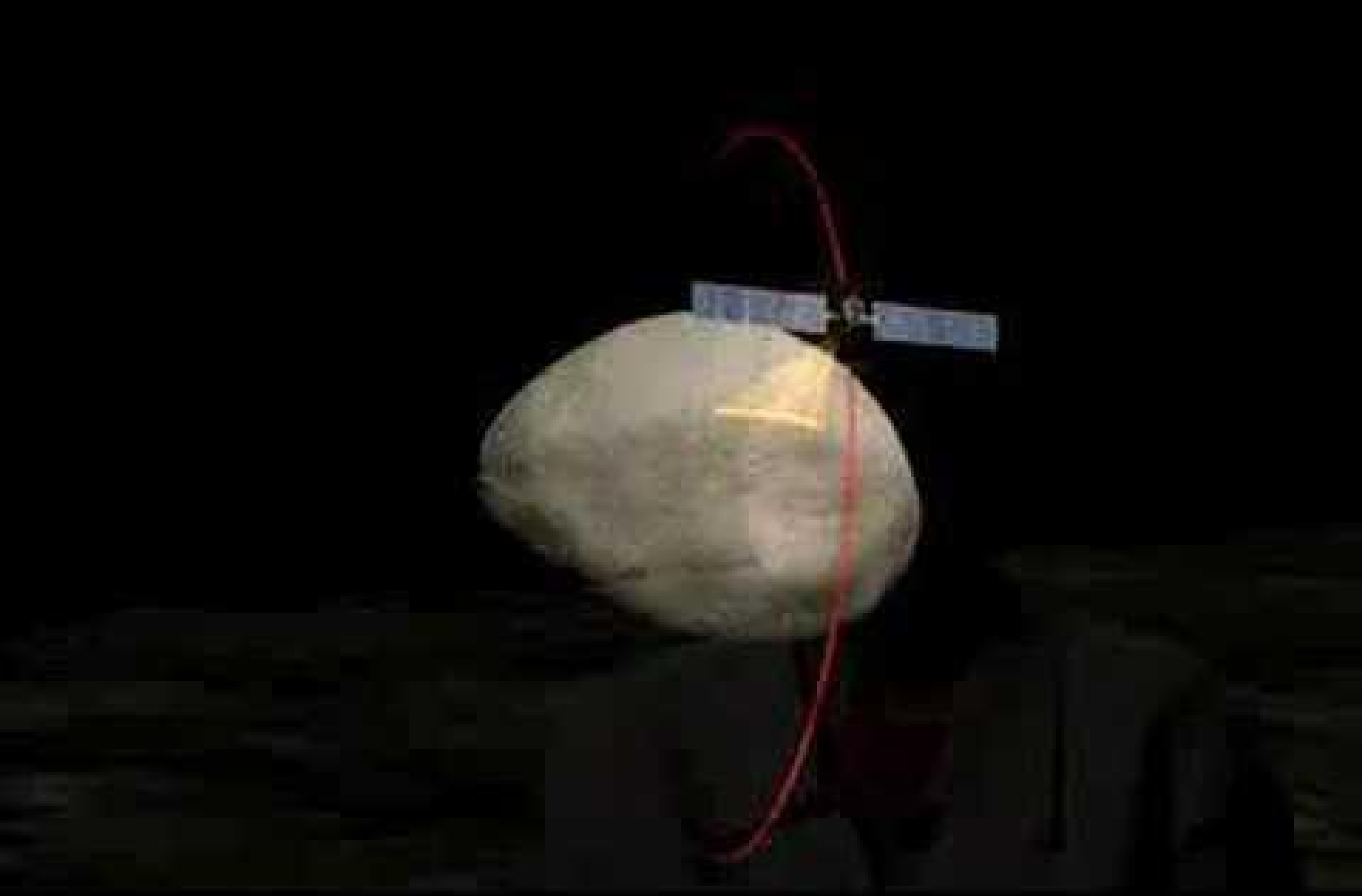

1
00:00:14,350 --> 00:00:10,030
if all goes as planned three two we have

2
00:00:17,560 --> 00:00:14,360
main engine start in 2007 and liftoff a

3
00:00:20,840 --> 00:00:17,570
delta 2 rocket will carried on beyond

4
00:00:24,839 --> 00:00:23,339
when that dawn spacecraft lifts off and

5
00:00:26,189 --> 00:00:24,849
we're on our way to finding out about

6
00:00:28,170 --> 00:00:26,199
some of the biggest mysteries in the

7
00:00:31,679 --> 00:00:28,180
solar system that's something we can all

8
00:00:33,720 --> 00:00:31,689
be part of it's so cool going to the

9
00:00:36,990 --> 00:00:33,730
asteroid belt this ring of broken up

10
00:00:39,689 --> 00:00:37,000
debris between Mars and Jupiter these

11
00:00:42,990 --> 00:00:39,699
are among the last unexplored worlds in

12
00:00:47,579 --> 00:00:43,000
the inner solar system the asteroid belt

13
00:00:49,979 --> 00:00:47,589

is really fascinating because it's kind

14
00:00:53,340 --> 00:00:49,989
of like the boneyard of material that's

15
00:00:56,670 --> 00:00:53,350
left over from forming all these planets

16
00:00:58,590 --> 00:00:56,680
it's fragments of explosions of

17
00:01:01,709 --> 00:00:58,600
planetary embryos perhaps during

18
00:01:03,840 --> 00:01:01,719
collisions or material that's come in

19
00:01:05,880 --> 00:01:03,850
from other parts of the solar system and

20
00:01:09,480 --> 00:01:05,890
been captured into this orbit of the

21
00:01:11,940 --> 00:01:09,490
asteroid belt we're going out to Ceres

22
00:01:15,779 --> 00:01:11,950
and also to Vesta and these are very

23
00:01:18,029 --> 00:01:15,789
different bodies Vesta is the brightest

24
00:01:21,180 --> 00:01:18,039
asteroid in the solar system and the

25
00:01:23,160 --> 00:01:21,190
only one visible to the naked eye in one

26
00:01:24,600 --> 00:01:23,170
sense it's sort of like our moon but in

27
00:01:27,540 --> 00:01:24,610
another sense that's sort of like the

28
00:01:29,940 --> 00:01:27,550
earth it's got a iron core just like the

29
00:01:32,839 --> 00:01:29,950
earth does and it may have had many of

30
00:01:36,300 --> 00:01:32,849
the processes acting that the earth has

31
00:01:38,550 --> 00:01:36,310
the three science instruments on Don all

32
00:01:40,919 --> 00:01:38,560
work together to tell us about the

33
00:01:43,529 --> 00:01:40,929
surfaces of the body and from that week

34
00:01:45,510 --> 00:01:43,539
we try to work back to you know how the

35
00:01:48,960 --> 00:01:45,520
whole thing was put together and what

36
00:01:51,359 --> 00:01:48,970
happened to it scientists believe series

37
00:01:53,010 --> 00:01:51,369
represents a transition from the rocky

38
00:01:55,919 --> 00:01:53,020

terrestrial planets of the inner solar

39
00:01:57,320 --> 00:01:55,929
system through the dashes and icy worlds

40
00:02:01,320 --> 00:01:57,330
of the outer solar system

41
00:02:03,270 --> 00:02:01,330
Ceres likely has a rocky core and a very

42
00:02:04,859 --> 00:02:03,280
thick ice mantle there's even the

43
00:02:08,430 --> 00:02:04,869
possibility that there's liquid water

44
00:02:10,499 --> 00:02:08,440
under the surface of Ceres we estimated

45
00:02:12,809 --> 00:02:10,509
from our measurements with Hubble Space

46
00:02:16,050 --> 00:02:12,819
Telescope that it's got almost a hundred

47
00:02:18,930 --> 00:02:16,060
kilometres of water on top of a rocky

48
00:02:20,580 --> 00:02:18,940
core to accomplish Dawn's journey into

49
00:02:22,350 --> 00:02:20,590
the heart of the asteroid belt the

50
00:02:24,330 --> 00:02:22,360
spaceship one whose engine will work

51
00:02:25,809 --> 00:02:24,340
without fail for years at a time is

52
00:02:28,209 --> 00:02:25,819
required

53
00:02:30,970 --> 00:02:28,219
Dawn's remarkable ion engines employ

54
00:02:34,750 --> 00:02:30,980
electrical currents magnetic fields and

55
00:02:37,539 --> 00:02:34,760
xenon the high-tech innards of an ion

56
00:02:40,300 --> 00:02:37,549
engine changes xenon into a positively

57
00:02:43,360 --> 00:02:40,310
charged plasma and accelerated out the

58
00:02:45,459 --> 00:02:43,370
engine at speeds over 78,000 miles per

59
00:02:47,890 --> 00:02:45,469
hour the ion engine pushes on the

60
00:02:50,229 --> 00:02:47,900
spacecraft about as hard as the single

61
00:02:52,990 --> 00:02:50,239
piece of paper pushes on my hand but

62
00:02:55,330 --> 00:02:53,000
this very gentle thrust eventually

63
00:02:57,729 --> 00:02:55,340

builds up and allows the spacecraft to

64
00:02:59,589 --> 00:02:57,739
achieve very very high speed with the

65
00:03:02,199 --> 00:02:59,599
ion propulsion system Don will be the

66
00:03:05,229 --> 00:03:02,209
first spacecraft ever to orbit to target

67
00:03:08,080 --> 00:03:05,239
bodies after leaving Earth a mission

68
00:03:10,780 --> 00:03:08,090
into our distant past a mission for the