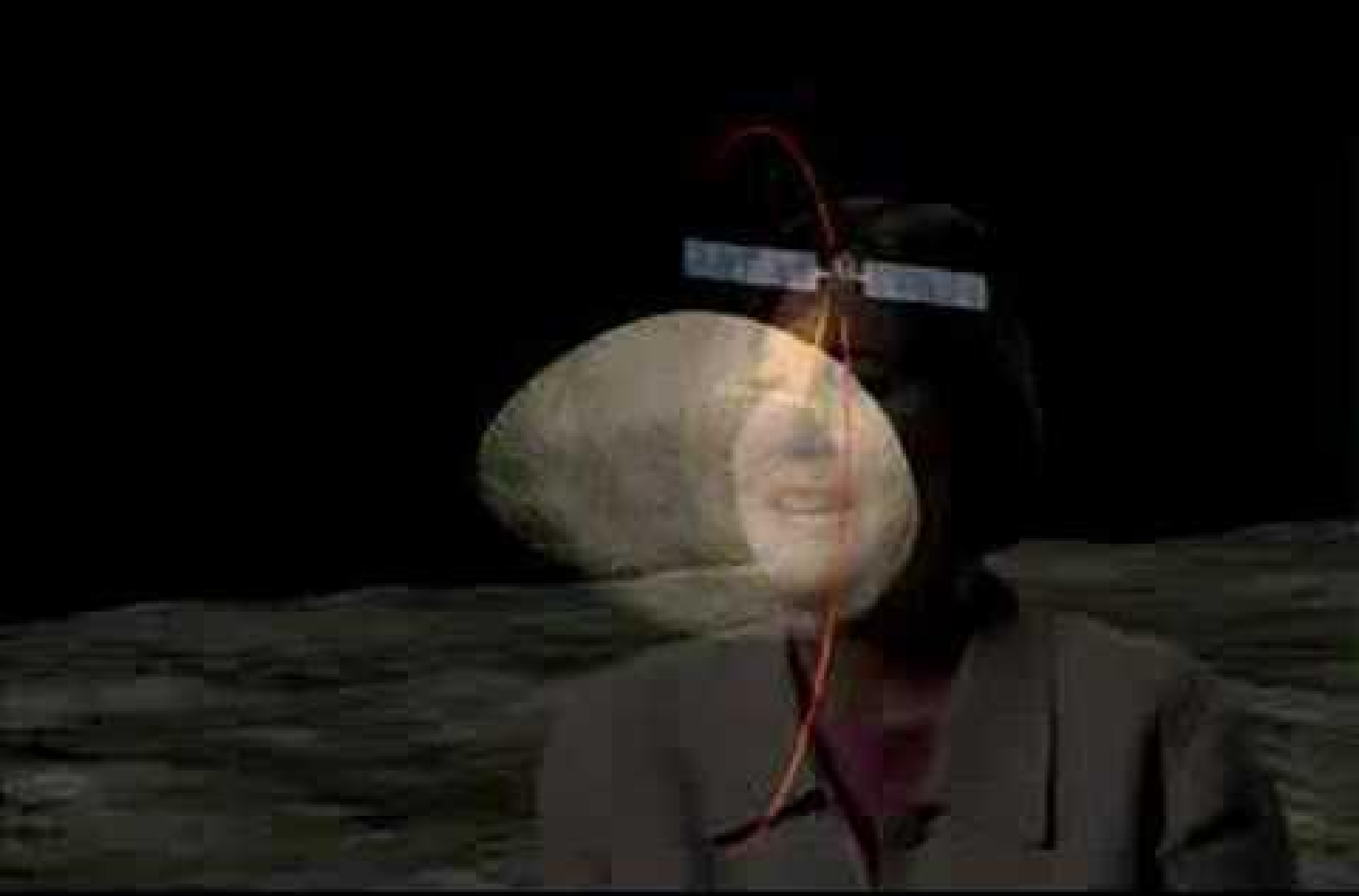

1
00:00:13,070 --> 00:00:10,160
if all goes as planned 32 we have main

2
00:00:16,970 --> 00:00:13,080
engine start in the summer of 2007 and

3
00:00:21,190 --> 00:00:16,980
lift on a delta 2 rocket who carried on

4
00:00:24,760 --> 00:00:23,500
when that dawn spacecraft lifts off and

5
00:00:26,080 --> 00:00:24,770
we're on our way to finding out about

6
00:00:28,090 --> 00:00:26,090
some of the biggest mysteries in the

7
00:00:31,600 --> 00:00:28,100
solar system that's something we can all

8
00:00:33,610 --> 00:00:31,610
be part of its so cool going to the

9
00:00:36,910 --> 00:00:33,620
asteroid belt this ring of broken up

10
00:00:39,610 --> 00:00:36,920
debris between Mars and Jupiter these

11
00:00:42,729 --> 00:00:39,620
are among the last unexplored worlds in

12
00:00:47,500 --> 00:00:42,739
the inner solar system the asteroid belt

13
00:00:49,950 --> 00:00:47,510

is really fascinating because it's kind

14
00:00:53,160 --> 00:00:49,960
of like the bone yard of material that's

15
00:00:57,040 --> 00:00:53,170
left over from forming all these planets

16
00:00:59,640 --> 00:00:57,050
its fragments of explosions of planetary

17
00:01:02,740 --> 00:00:59,650
embryos perhaps during collisions or

18
00:01:04,450 --> 00:01:02,750
material that's come in from other parts

19
00:01:06,930 --> 00:01:04,460
of the solar system and been captured

20
00:01:10,300 --> 00:01:06,940
into this orbit of the asteroid belt

21
00:01:12,430 --> 00:01:10,310
we're going out to series and also to

22
00:01:16,270 --> 00:01:12,440
Vesta and these are very different

23
00:01:18,370 --> 00:01:16,280
bodies Vesta is the brightest asteroid

24
00:01:21,340 --> 00:01:18,380
in the solar system and the only one

25
00:01:23,080 --> 00:01:21,350
visible to the naked eye in one sense

26
00:01:24,520 --> 00:01:23,090
it's sort of like our moon but in

27
00:01:27,460 --> 00:01:24,530
another sense that's sort of like the

28
00:01:29,859 --> 00:01:27,470
earth it's got a iron core just like the

29
00:01:32,730 --> 00:01:29,869
earth does and it may have had many of

30
00:01:35,859 --> 00:01:32,740
the processes acting that the earth has

31
00:01:38,440 --> 00:01:35,869
the three science instruments on dawn

32
00:01:41,080 --> 00:01:38,450
all work together to tell us about the

33
00:01:43,449 --> 00:01:41,090
surfaces of the body and from that we we

34
00:01:45,400 --> 00:01:43,459
try to work back to you know how the

35
00:01:47,069 --> 00:01:45,410
whole thing was put together and what

36
00:01:49,539 --> 00:01:47,079
happened to it

37
00:01:52,060 --> 00:01:49,549
scientists believe series represents a

38
00:01:54,310 --> 00:01:52,070

transition from the rocky terrestrial

39
00:01:56,200 --> 00:01:54,320
planets of the inner solar system should

40
00:01:59,469 --> 00:01:56,210
be dashes and icy worlds of the outer

41
00:02:02,830 --> 00:01:59,479
solar system series likely has a rocky

42
00:02:04,600 --> 00:02:02,840
core and a very thick ice mantle there's

43
00:02:07,450 --> 00:02:04,610
even the possibility that there's liquid

44
00:02:09,910 --> 00:02:07,460
water under the surface of Ceres we

45
00:02:11,949 --> 00:02:09,920
estimated from our measurements with

46
00:02:14,949 --> 00:02:11,959
Hubble Space Telescope that it's got

47
00:02:18,339 --> 00:02:14,959
almost a hundred kilometers of water on

48
00:02:19,900 --> 00:02:18,349
top of a rocky core to accomplish danza

49
00:02:22,089 --> 00:02:19,910
journey into the heart of the asteroid

50
00:02:24,250 --> 00:02:22,099
belt the spaceship one whose engine will

51
00:02:27,699 --> 00:02:24,260
work without fail for years at a time is

52
00:02:30,190 --> 00:02:27,709
required Dawn's remarkable ion engines

53
00:02:34,089 --> 00:02:30,200
employ electrical currents magnetic

54
00:02:36,850 --> 00:02:34,099
fields and xenon the high-tech innards

55
00:02:38,880 --> 00:02:36,860
of an ion engine change the xenon into a

56
00:02:41,140 --> 00:02:38,890
positively charged plasma and

57
00:02:44,500 --> 00:02:41,150
accelerated out the engine at speeds

58
00:02:46,930 --> 00:02:44,510
over 78,000 miles per hour the ion

59
00:02:48,940 --> 00:02:46,940
engine pushes on the spacecraft about as

60
00:02:51,900 --> 00:02:48,950
hard as the single piece of paper pushes

61
00:02:54,610 --> 00:02:51,910
on my hand but this very gentle thrust

62
00:02:56,259 --> 00:02:54,620
eventually builds up and allows the

63
00:02:58,809 --> 00:02:56,269

spacecraft to achieve very very high

64
00:03:00,580 --> 00:02:58,819
speed with the ion propulsion system

65
00:03:02,979 --> 00:03:00,590
dawn will be the first spacecraft ever

66
00:03:06,819 --> 00:03:02,989
to orbit to target bodies after leaving

67
00:03:10,000 --> 00:03:06,829
Earth a mission into our distant past a

68
00:03:12,819 --> 00:03:10,010
mission for the future a mission into