

# DUSK FOR DAWN

NASA MISSION TO THE ASTEROID BELT



Jet Propulsion Laboratory  
California Institute of Technology

1  
00:00:01,520 --> 00:00:02,520

[Music]

2  
00:00:02,580 --> 00:00:05,620

[Marc Rayman] You know, when you work on a mission this long

3  
00:00:05,820 --> 00:00:08,000

it feels like a part of you.

4  
00:00:08,010 --> 00:00:12,300

I've been a space enthusiast since I was four years old.

5  
00:00:12,300 --> 00:00:18,150

Getting to work on a mission like this is...it's a dream come true.

6  
00:00:18,150 --> 00:00:24,029

To me, Dawn is truly Earth's first interplanetary spaceship.

7  
00:00:24,029 --> 00:00:30,239

No other spacecraft has gone to a distant body, gone into orbit around it, maneuvered

8  
00:00:30,239 --> 00:00:36,129

there, then broken out of orbit, traveled elsewhere in the solar system to another alien

9  
00:00:36,129 --> 00:00:39,629

world and gone into orbit around it.

10  
00:00:39,629 --> 00:00:44,840

And it does that with ion propulsion which I first heard of on a Star Trek episode.

11  
00:00:44,840 --> 00:00:48,760

We've turned ion propulsion from science fiction

into science fact.

12  
00:00:49,920 --> 00:00:53,480  
[Carol Raymond] The Dawn mission really is a journey back to the beginning of the solar

13  
00:00:53,489 --> 00:00:54,489  
system.

14  
00:00:54,489 --> 00:00:57,149  
That's why we call it Dawn.

15  
00:00:57,149 --> 00:01:02,540  
We chose two time capsules from the beginning of the solar system, Vesta and Ceres, which

16  
00:01:02,540 --> 00:01:07,020  
are the most massive and largest bodies in the main asteroid belt.

17  
00:01:07,020 --> 00:01:11,150  
They both formed very early when the solar system was forming out of the protoplanetary

18  
00:01:11,150 --> 00:01:16,280  
disk and yet they ended up in these two very different states.

19  
00:01:16,280 --> 00:01:22,650  
Vesta is a dry, rocky body that looks a lot like our moon.

20  
00:01:22,650 --> 00:01:27,159  
Whereas Ceres had a lot of water and it looks much more like the icy moons of the outer

21  
00:01:27,160 --> 00:01:28,530  
solar system.

22

00:01:29,560 --> 00:01:34,960

[Rayman] And it seems like what determined their eventual fate was the location where

23

00:01:34,970 --> 00:01:36,420

they started.

24

00:01:36,420 --> 00:01:42,180

And we now believe that Ceres formed much farther from the sun than it is now.

25

00:01:42,180 --> 00:01:47,660

[Raymond] When Dawn found the bright material on Ceres, what we saw was

26

00:01:47,660 --> 00:01:49,259

completely mind blowing.

27

00:01:49,259 --> 00:01:52,500

It was made of sodium carbonate.

28

00:01:52,500 --> 00:01:58,590

Sodium carbonate is not common in the solar system but we see it coming out of the plumes

29

00:01:58,590 --> 00:02:06,880

of Enceladus, we see it in lakes on Earth, and here it was on the surface of Ceres.

30

00:02:08,980 --> 00:02:13,260

[Rayman] The mission will end when Dawn runs out of the conventional chemical propellant

31

00:02:13,270 --> 00:02:19,060

that it uses to orient itself in the zero gravity of space.

32

00:02:19,060 --> 00:02:29,220

Dawn will become this inert celestial monument in orbit around the dwarf planet that it unveiled.

33  
00:02:29,220 --> 00:02:37,260  
Dawn serves a lasting reminder that the passion  
for bold adventures and our noble aspirations

34  
00:02:37,260 --> 00:02:44,690  
to reach out into the cosmos take us far far  
beyond the confines of our humble home here

35  
00:02:44,690 --> 00:02:45,680  
on planet Earth.

36  
00:02:48,380 --> 00:02:54,680  
[Text] The Dawn spacecraft has operated for  
11 years, three years longer than originally planned.