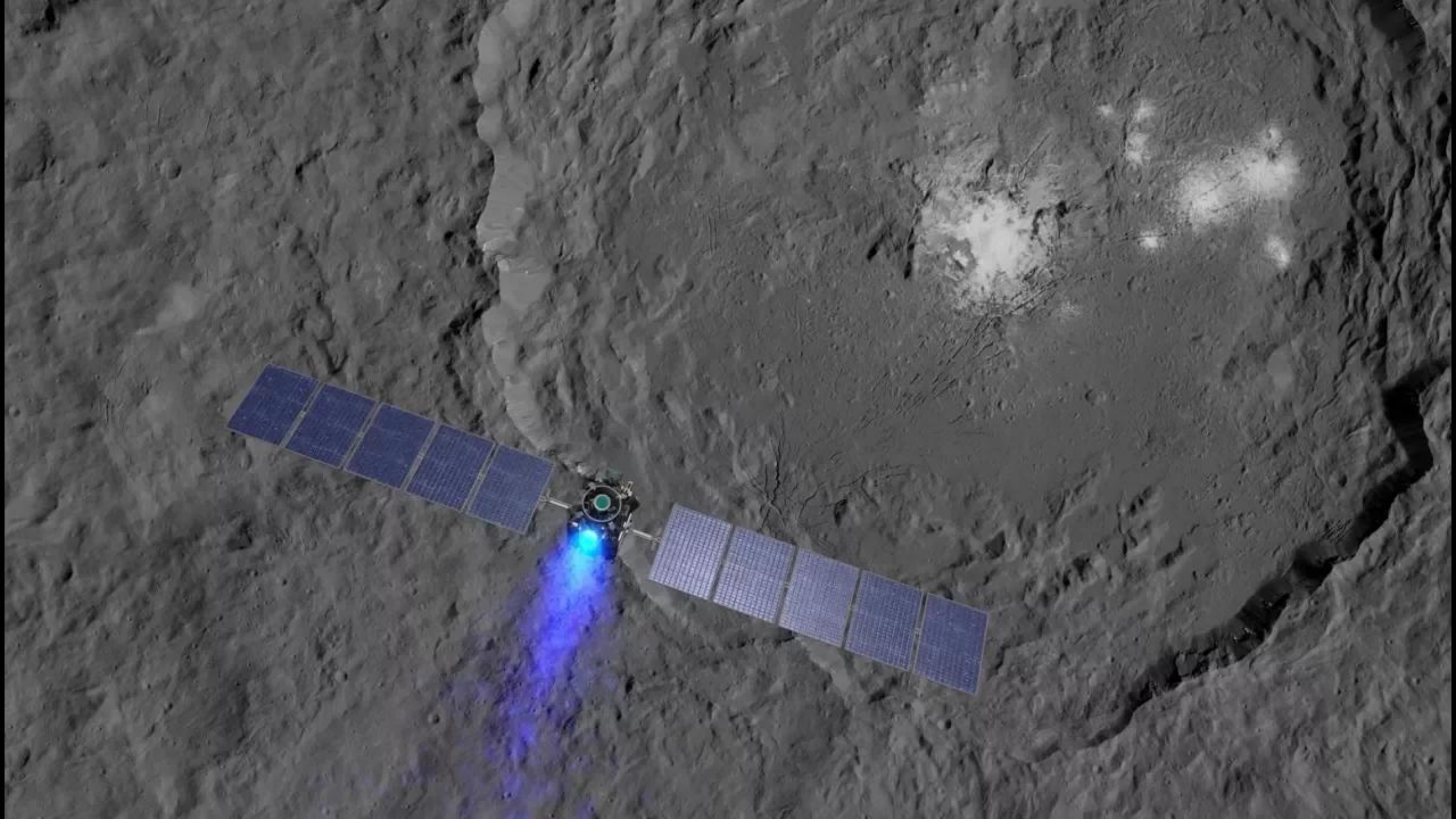

1
00:00:01,101 --> 00:00:03,336
The Bright Stuff:
New Dawn Findings at Ceres

2
00:00:03,369 --> 00:00:06,072
[Nathan Stein, Doctoral
Researcher, Caltech]

3
00:00:06,105 --> 00:00:07,740
When folks think about asteroids

4
00:00:07,773 --> 00:00:09,909
they might think about
dead chunks of rock

5
00:00:09,942 --> 00:00:11,244
that are floating around space.

6
00:00:11,277 --> 00:00:13,112
And what we see
with Ceres is that

7
00:00:13,145 --> 00:00:15,114
the processes are
modifying the surface,

8
00:00:15,147 --> 00:00:16,382
even in the present day.

9
00:00:16,415 --> 00:00:18,017
[Jennifer Scully, JPL
Research Scientist]

10
00:00:18,050 --> 00:00:19,352
Approaching Ceres,

11
00:00:19,385 --> 00:00:21,554
we saw this very bright
region on the surface.

12
00:00:21,587 --> 00:00:22,755
And then as we got
closer and closer

13
00:00:22,788 --> 00:00:24,624
you saw that there were
multiple bright regions

14
00:00:24,657 --> 00:00:26,626
in this one crater.

15
00:00:27,360 --> 00:00:28,127
There's the one in the center,

16
00:00:28,160 --> 00:00:30,196
which is called Cerealia Facula

17
00:00:30,229 --> 00:00:32,698
and then there's the ones off
to the side in the crater floor

18
00:00:32,731 --> 00:00:34,901
which are called
Vinalia Faculae.

19
00:00:34,934 --> 00:00:38,638
Cerealia is located in a pit
within the center of the crater.

20
00:00:38,671 --> 00:00:41,274
That pit is about
10 kilometers wide.

21
00:00:41,307 --> 00:00:43,242
And so it's about 1/9
the diameter of

22
00:00:43,275 --> 00:00:44,677

Occator Crater itself.

23
00:00:44,710 --> 00:00:47,947
And then within that pit there
is a little central dome.

24
00:00:47,980 --> 00:00:49,782
[Stein] What we're seeing
is an indication that

25
00:00:49,815 --> 00:00:51,284
there are liquid brines

26
00:00:51,317 --> 00:00:53,619
potentially in the subsurface,
even in the present day,

27
00:00:53,652 --> 00:00:56,789
rising to the surface and
becoming these bright spots.

28
00:00:56,822 --> 00:00:58,991
And that tells us that
there has to be a process

29
00:00:59,024 --> 00:01:03,129
providing energy to drive
these fluids to the surface.

30
00:01:03,162 --> 00:01:06,899
We call them bright spots, but
actually it's a relative term.

31
00:01:06,932 --> 00:01:09,802
The brightest bright spot on
Ceres, Cerealia Facula,

32
00:01:09,835 --> 00:01:12,405
has an albedo of around .5

33
00:01:12,438 --> 00:01:15,708
which is about the same
brightness as dirty snow.

34
00:01:15,741 --> 00:01:18,511
Bright spots on Ceres aren't
limited to a single place.

35
00:01:18,544 --> 00:01:20,880
We've found that there are
over 300 bright spots,

36
00:01:20,913 --> 00:01:22,281
all over the surface of Ceres.

37
00:01:22,314 --> 00:01:25,284
And that indicates that this is
a relatively widespread process.

38
00:01:26,652 --> 00:01:29,255
[Scully] The salts that
we see in Occator Crater

39
00:01:29,288 --> 00:01:31,591
are of similar composition
to salts that we find

40
00:01:31,624 --> 00:01:33,459
in Mono Lake in California.

41
00:01:33,492 --> 00:01:35,862
It's interesting that you can
have these similar materials

42
00:01:35,895 --> 00:01:37,997
found in different places

43
00:01:38,030 --> 00:01:40,333
that were formed by

different processes.

44
00:01:40,366 --> 00:01:42,568
[Stein] Ceres represents
something of a bridge

45
00:01:42,601 --> 00:01:44,570
between the bodies of
the inner solar system

46
00:01:44,603 --> 00:01:45,805
and the outer solar system.

47
00:01:45,838 --> 00:01:48,808
In the inner solar system
we see rocky bodies.

48
00:01:48,841 --> 00:01:51,744
In the outer solar system we,
more broadly, see icy bodies.

49
00:01:51,777 --> 00:01:54,547
And Ceres is sitting
somewhere in-between.

50
00:01:54,580 --> 00:01:57,416
But we know now from the bright
spots that it is changing.

51
00:01:57,449 --> 00:01:59,485
The bright spots that are
already on the surface

52
00:01:59,518 --> 00:02:01,721
are darkening over
time scales of

53
00:02:01,754 --> 00:02:04,090
hundreds of millions of
years or even less.

54
00:02:04,123 --> 00:02:07,793
And we also see that the bright
spots maybe are still forming.

55
00:02:07,826 --> 00:02:09,829
So Ceres is still
an active body.

56
00:02:09,862 --> 00:02:11,464
And we still have a lot
of questions about

57
00:02:11,497 --> 00:02:13,332
what are the processes
that are modifying

58
00:02:13,365 --> 00:02:15,134
Ceres' surface over time

59
00:02:15,167 --> 00:02:18,671
and what that tells us about
the internal nature of Ceres

60
00:02:18,704 --> 00:02:21,274
and how it actually formed.

61
00:02:22,008 --> 00:02:25,778
NASA Jet Propulsion Laboratory