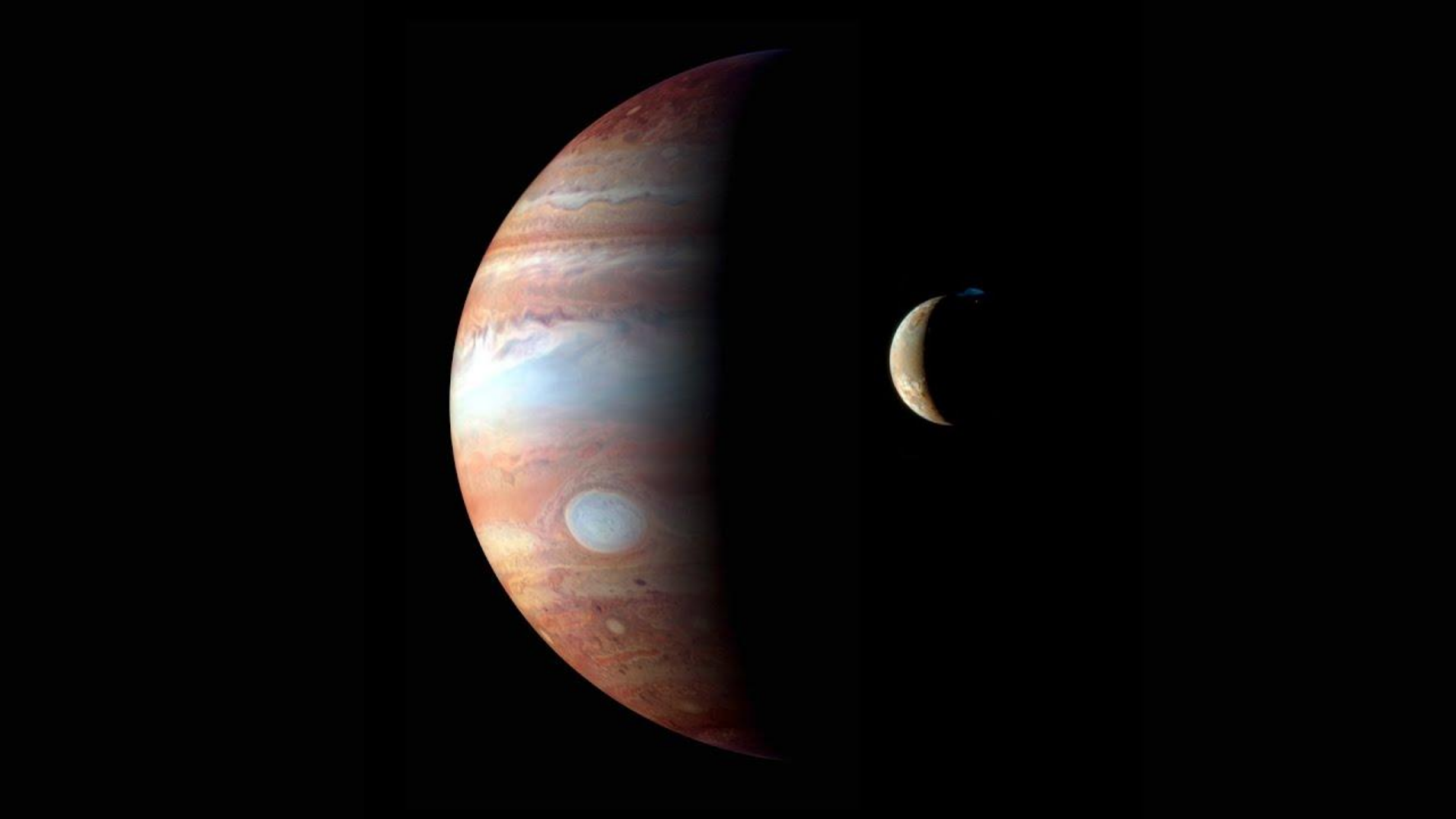

1
00:00:00,030 --> 00:00:05,080
[music] My name is David Choi, and I study the weather on giant planets.

2
00:00:05,100 --> 00:00:08,480
When we look at Jupiter we're seeing the top of its atmosphere and its weather layer,

3
00:00:08,500 --> 00:00:12,410
and its weather layer contains a lot of interesting features such as jet streams,

4
00:00:12,430 --> 00:00:16,440
vortices, storms, and these particular features called hot spots.

5
00:00:16,460 --> 00:00:21,680
So hot spots are like holes in the clouds because they appear very dark when observed in visible light,

6
00:00:21,700 --> 00:00:24,430
but in near infrared light they appear very bright,

7
00:00:24,450 --> 00:00:28,700
and this indicates that we're seeing deeper down into warmer layers of the atmosphere.

8
00:00:28,720 --> 00:00:32,870
Hot spots have been previously studied by the Galileo atmospheric probe.

9
00:00:32,890 --> 00:00:39,240
In 1995 the spacecraft released a probe that descended into Jupiter's atmosphere specifically at a hot spot,

10
00:00:39,260 --> 00:00:44,980
and this probe made the first in situ measurements and the only in situ measurements of Jupiter that exist toda

11
00:00:45,000 --> 00:00:47,900
So it's very important to understand how hot spot meteorology works,

12
00:00:47,920 --> 00:00:52,630
in order to place these in situ measurements from the Galileo probe in its proper context.

13
00:00:52,650 --> 00:00:57,880

In 2000 the Cassini spacecraft flew past Jupiter and created a series of still images

14
00:00:57,900 --> 00:01:01,650
that we compiled into time-lapse movies of Jupiter's atmosphere.

15
00:01:01,670 --> 00:01:08,110
Using these movies, we observed Rossby waves that caused north-south meanders in a jet stream south of th

16
00:01:08,130 --> 00:01:11,380
With new movies we instead focused on hot spots.

17
00:01:11,400 --> 00:01:15,880
Hot spots are unique because we believe that there is a Rossby wave similar to what we previously detected,

18
00:01:15,900 --> 00:01:22,240
but instead of this Rossby wave moving north-south, it primarily moves up and down in the atmosphere.

19
00:01:22,260 --> 00:01:26,630
The downward portion of the wave pushes air down into warmer layers of the atmosphere.

20
00:01:26,650 --> 00:01:32,230
This causes any clouds that are embedded within the wave to evaporate and prevents further clouds from form

21
00:01:32,250 --> 00:01:36,780
So at any given time there are approximately eight to ten hot spots in Jupiter's atmosphere

22
00:01:36,800 --> 00:01:39,830
that are spaced roughly evenly apart from one another.

23
00:01:39,850 --> 00:01:46,380
We believe that each of the downward portions of this Rossby wave corresponds to the hot spots that we see o

24
00:01:46,400 --> 00:01:50,480
This new finding is exciting because it will allow us to re-examine the Galileo probe data,