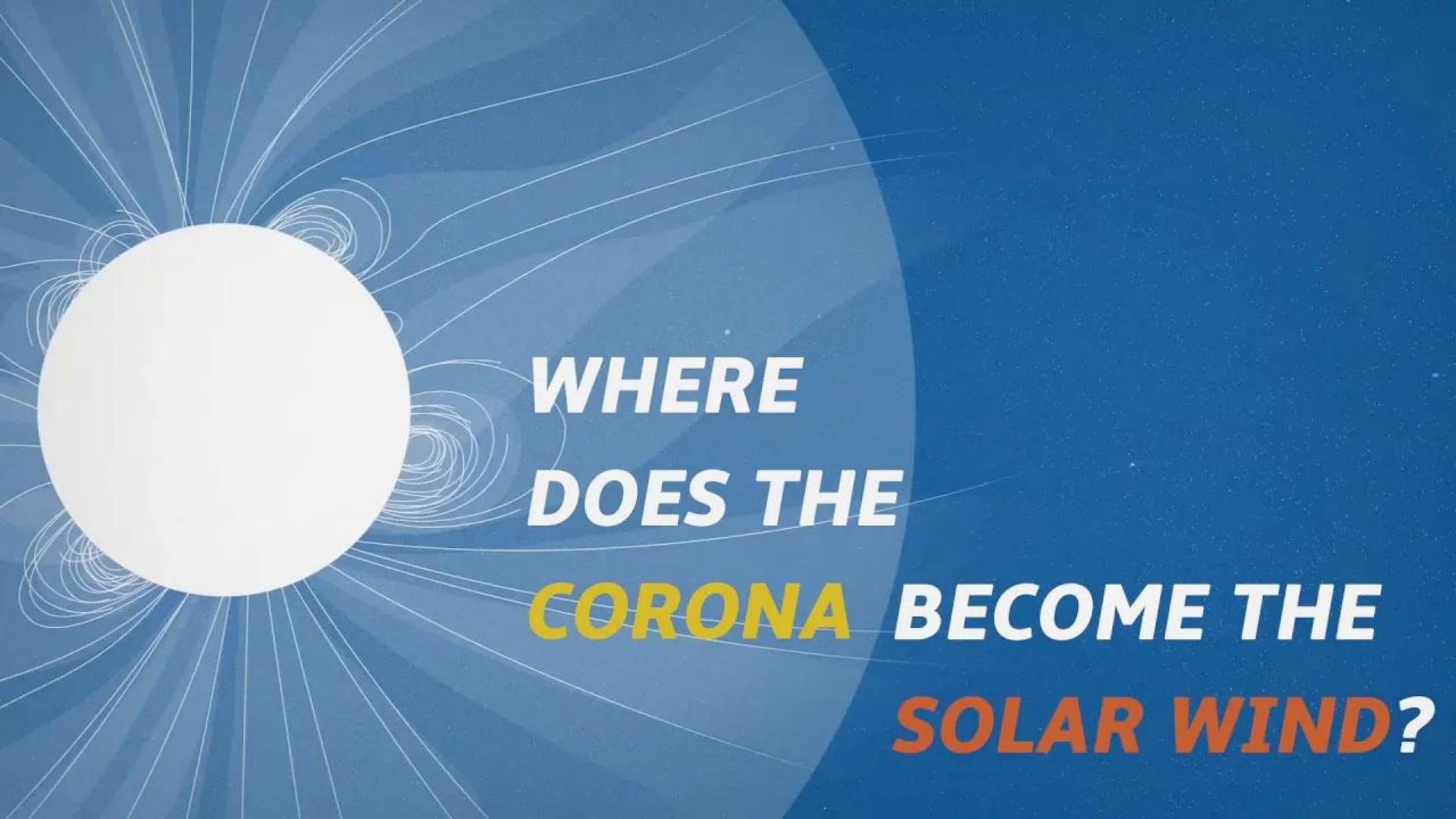
WHERE
DOES THE
CORONA BECOME THE
SOLAR WIND?

1
00:00:00,070 --> 00:00:04,150
Narrator: Scientists have now spotted signs of a structured boundary between

2
00:00:04,170 --> 00:00:08,250
the sun and the rest of the solar system. The sun is

3
00:00:08,270 --> 00:00:12,290
not a hard ball in space, nor is it a giant ball of

4
00:00:12,310 --> 00:00:16,500
fire. Instead, it's a mass of charged particles and magnetic

5
00:00:16,520 --> 00:00:20,610
fields. This material extends outward, flowing beyond the surface

6
00:00:20,630 --> 00:00:24,750
of the sun, creating an atmosphere that spreads throughout our

7
00:00:24,770 --> 00:00:28,940
solar system. But the transition is not perfectly seamless.

8
00:00:28,960 --> 00:00:33,010
Our star can be characterized into layers. Each region

9
00:00:33,030 --> 00:00:37,060
has its own temperature ranges and special properties. We call the sun's

10
00:00:37,080 --> 00:00:41,200
atmosphere the corona. The steady breeze of

11
00:00:41,220 --> 00:00:45,380
particles flowing out from the sun and filling the space between the planets

12
00:00:45,400 --> 00:00:49,450
is the solar wind. New research indicates that there is a

13
00:00:49,470 --> 00:00:53,540

discernible transition between the corona and the solar wind.

14
00:00:53,560 --> 00:00:57,680
This difference is marked by a visible change in the consistency

15
00:00:57,700 --> 00:01:01,790
of solar material departing the sun.

16
00:01:01,810 --> 00:01:05,880
About 20 million miles out from the sun, the very nature of the solar material

17
00:01:05,900 --> 00:01:09,970
changes, and the sun's magnetic field no longer

18
00:01:09,990 --> 00:01:14,090
controls its movement. At this point, the flow becomes more

19
00:01:14,110 --> 00:01:18,190
turbulent. Like water from a squirt gun, the plasma

20
00:01:18,210 --> 00:01:22,380
starts as a stream, but then breaks into drops. The farther out

21
00:01:22,400 --> 00:01:26,450
it goes, the weaker the sun's magnetic control of the material, and

22
00:01:26,470 --> 00:01:30,570
the less clear its form becomes. To find this transition,

23
00:01:30,590 --> 00:01:34,790
scientists took images of the faint solar wind and used an

24
00:01:34,810 --> 00:01:38,860
algorithm to dim the competing brightness of background stars and

25
00:01:38,880 --> 00:01:42,980
dust. These are the first movies of the solar wind

26
00:01:43,000 --> 00:01:47,180
itself in a previously unmapped region,

27
00:01:47,200 --> 00:01:51,380
helping us understand what's flowing from the sun, through the space

28
00:01:51,400 --> 00:01:55,500
around our planet and out to the edges of our solar system--crucial

29
00:01:55,520 --> 00:01:59,610
information as we continue to explore.