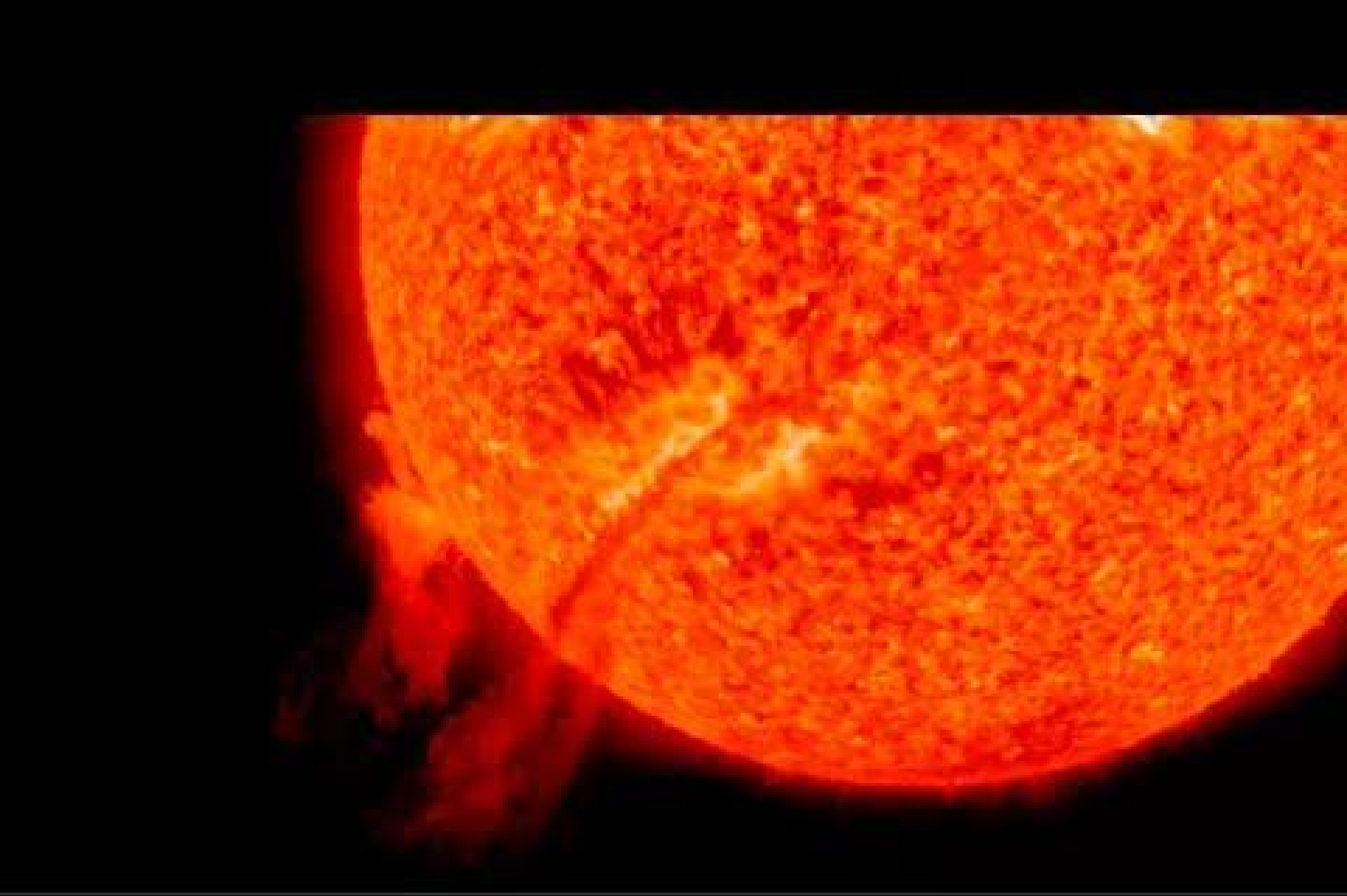

1
00:00:09,070 --> 00:00:06,030
Sound Effect

2
00:00:09,090 --> 00:00:13,140
Music, Narrator: In 2006 NASA launched the Solar

3
00:00:13,160 --> 00:00:17,170
TErrestrial RElations Observatory, or STEREO, spacecraft.

4
00:00:17,190 --> 00:00:21,210
Over the last 4 years, the two spacecraft have slowly made their way along Earth's

5
00:00:21,230 --> 00:00:25,240
orbit, with STEREO A advancing ahead, and STEREO B falling

6
00:00:25,260 --> 00:00:29,270
behind. As they've separated, our view of the sun

7
00:00:29,290 --> 00:00:33,360
has increased. Other satellites near Earth,

8
00:00:33,380 --> 00:00:37,510
such as SOHO, and now SDO, continue to watch the sun from Earth's

9
00:00:37,530 --> 00:00:41,560
perspective, while the STEREO spacecraft see increasingly different views.

10
00:00:41,580 --> 00:00:45,600
Now STEREO A and B are almost exactly opposite each other

11
00:00:45,620 --> 00:00:49,700
and for the first time in human history, we have a view of the entire sun

12
00:00:49,720 --> 00:00:53,740
Music

13
00:00:53,760 --> 00:00:57,850

The sun has a huge

14
00:00:57,870 --> 00:01:01,930
influence on everyday life, and with our increased reliance on technology, this

15
00:01:01,950 --> 00:01:05,950
influence just keeps getting stronger. Coronal mass

16
00:01:05,970 --> 00:01:09,990
ejections and solar flares are the hurricanes of space weather and they have the power to

17
00:01:10,010 --> 00:01:14,070
disrupt our navigation systems, communications and even electrical grids,

18
00:01:14,090 --> 00:01:18,090
so it's vital we know when they are coming. Just as protecting our homes

19
00:01:18,110 --> 00:01:22,140
requires the best possible weather forecast, protecting these systems requires

20
00:01:22,160 --> 00:01:26,230
the best possible space weather forecast. Sunspots and

21
00:01:26,250 --> 00:01:30,290
other active regions on the sun can help predict a new round of such space weather, but

22
00:01:30,310 --> 00:01:34,340
before STEREO we were able to see only one side of the sun at a time;

23
00:01:34,360 --> 00:01:38,380
we couldn't tell what was starting to form on the far side. Since the sun

24
00:01:38,400 --> 00:01:42,440
takes about 27 days to rotate once, solar activity had plenty of time

25
00:01:42,460 --> 00:01:46,500
to build unnoticed. Scientists first began

26
00:01:46,520 --> 00:01:50,520
to get a sense of the far side with SOHO's Michelson Doppler Imager which worked almost

27
00:01:50,540 --> 00:01:54,560
like an ultrasound to give a view of the sun's back based on observations of the ripples on

28
00:01:54,580 --> 00:01:58,640
its front. Now STERE can make direct observations and

29
00:01:58,660 --> 00:02:02,660
eliminate any uncertainty about activity on the far side of the sun.

30
00:02:02,680 --> 00:02:06,680
This unprecedented view will last for at least another 8 years as the

31
00:02:06,710 --> 00:02:10,720
spacecraft slowly continue their journey. They will cross behind the sun,

32
00:02:10,740 --> 00:02:14,770
and then once again continue to opposite sides of the sun, this time with their position

33
00:02:14,790 --> 00:02:18,810
reversed. During that time, astronomers will be able to see

34
00:02:18,830 --> 00:02:22,890
magnetic active regions wherever they form on the sun, so we will know about regions on the far

35
00:02:22,910 --> 00:02:26,940
side well before any Earth-based observatory can see them.

36
00:02:26,960 --> 00:02:30,980
The full view of the sun from STEREO and SDO

37
00:02:31,000 --> 00:02:35,030
coupled with the other spacecraft in NASA's Heliophysics fleet, will help scientists

38
00:02:35,050 --> 00:02:39,080

understand our dynamic star and give us more time to prepare for the next big

39
00:02:39,100 --> 00:02:43,140
storm. Static

40
00:02:43,160 --> 00:02:47,160
static