1
00:00:05,349 --> 00:00:03,270
in 2006 nasa launched the solar

2
00:00:07,670 --> 00:00:05,359
terrestrial relations observatory or

3
00:00:09,190 --> 00:00:07,680
stereo spacecraft

4
00:00:10,790 --> 00:00:09,200
over the last four years the two

5
00:00:12,950 --> 00:00:10,800
spacecraft have slowly made their way

6
00:00:15,350 --> 00:00:12,960
along earth's orbit with stereo a

7
00:00:17,189 --> 00:00:15,360
advancing ahead and stereo b falling

8
00:00:19,429 --> 00:00:17,199
behind

9
00:00:22,150 --> 00:00:19,439
as they've separated our view of the sun

10
00:00:24,470 --> 00:00:22,160
has increased

11
00:00:26,790 --> 00:00:24,480
other satellites near earth such as soho

12
00:00:28,390 --> 00:00:26,800
and now sdo continue to watch the sun

13
00:00:30,310 --> 00:00:28,400

from earth's perspective while the

14
00:00:32,549 --> 00:00:30,320
stereo spacecraft see increasingly

15
00:00:34,709 --> 00:00:32,559
different views

16
00:00:36,709 --> 00:00:34,719
now stereo a and b are almost exactly

17
00:00:38,869 --> 00:00:36,719
opposite each other and for the first

18
00:00:47,029 --> 00:00:38,879
time in human history we have a view of

19
00:00:50,790 --> 00:00:48,869
the sun has a huge influence on everyday

20
00:00:52,790 --> 00:00:50,800
life and with our increased reliance on

21
00:00:55,189 --> 00:00:52,800
technology this influence just keeps

22
00:00:57,189 --> 00:00:55,199
getting stronger

23
00:00:59,189 --> 00:00:57,199
coronal mass ejections and solar flares

24
00:01:00,549 --> 00:00:59,199
are the hurricanes of space weather and

25
00:01:02,709 --> 00:01:00,559
they have the power to disrupt our

26
00:01:05,109 --> 00:01:02,719
navigation systems communications and

27
00:01:07,109 --> 00:01:05,119
even electrical grids so it's vital we

28
00:01:08,870 --> 00:01:07,119
know when they are coming

29
00:01:10,550 --> 00:01:08,880
just as protecting our homes requires

30
00:01:12,230 --> 00:01:10,560
the best possible weather forecast

31
00:01:15,590 --> 00:01:12,240
protecting these systems requires the

32
00:01:17,350 --> 00:01:15,600
best possible space weather forecast

33
00:01:19,190 --> 00:01:17,360
sunspots and other active regions on the

34
00:01:21,749 --> 00:01:19,200
sun can help predict a new round of such

35
00:01:23,670 --> 00:01:21,759
space weather but before stereo we were

36
00:01:24,550 --> 00:01:23,680
able to see only one side of the sun at

37
00:01:25,830 --> 00:01:24,560
a time

38
00:01:27,910 --> 00:01:25,840

we couldn't tell what was starting to

39
00:01:29,910 --> 00:01:27,920
form on the far side

40
00:01:32,310 --> 00:01:29,920
since the sun takes about 27 days to

41
00:01:35,510 --> 00:01:32,320
rotate once solar activity had plenty of

42
00:01:37,190 --> 00:01:35,520
time to build unnoticed

43
00:01:38,789 --> 00:01:37,200
scientists first began to get a sense of

44
00:01:40,789 --> 00:01:38,799
the far side with soho's michelson

45
00:01:42,230 --> 00:01:40,799
doppler imager which worked almost like

46
00:01:44,230 --> 00:01:42,240
an ultrasound to give a view of the

47
00:01:46,389 --> 00:01:44,240
sun's back based on observations of the

48
00:01:48,550 --> 00:01:46,399
ripples on its front

49
00:01:50,230 --> 00:01:48,560
now stereo can make direct observations

50
00:01:53,350 --> 00:01:50,240
and eliminate any uncertainty about

51
00:01:55,109 --> 00:01:53,360
activity on the far side of the sun

52
00:01:56,550 --> 00:01:55,119
this unprecedented view will last for at

53
00:01:59,350 --> 00:01:56,560
least another eight years as the

54
00:02:01,109 --> 00:01:59,360
spacecraft slowly continue their journey

55
00:02:03,030 --> 00:02:01,119
they will cross behind the sun and then

56
00:02:04,870 --> 00:02:03,040
once again continue to opposite sides of

57
00:02:06,469 --> 00:02:04,880
the sun this time with their positions

58
00:02:08,309 --> 00:02:06,479
reversed

59
00:02:09,910 --> 00:02:08,319
during that time astronomers will be

60
00:02:11,830 --> 00:02:09,920
able to see magnetic active regions

61
00:02:13,670 --> 00:02:11,840
wherever they form on the sun so we will

62
00:02:15,670 --> 00:02:13,680
know about regions on the far side well

63
00:02:18,390 --> 00:02:15,680

before any earth-based observatory can

64
00:02:22,550 --> 00:02:20,229
the full view of the sun from stereo and

65
00:02:24,550 --> 00:02:22,560
sdo coupled with the other spacecraft in

66
00:02:26,710 --> 00:02:24,560
nasa's heliophysics fleet will help

67
00:02:28,630 --> 00:02:26,720
scientists understand our dynamic star