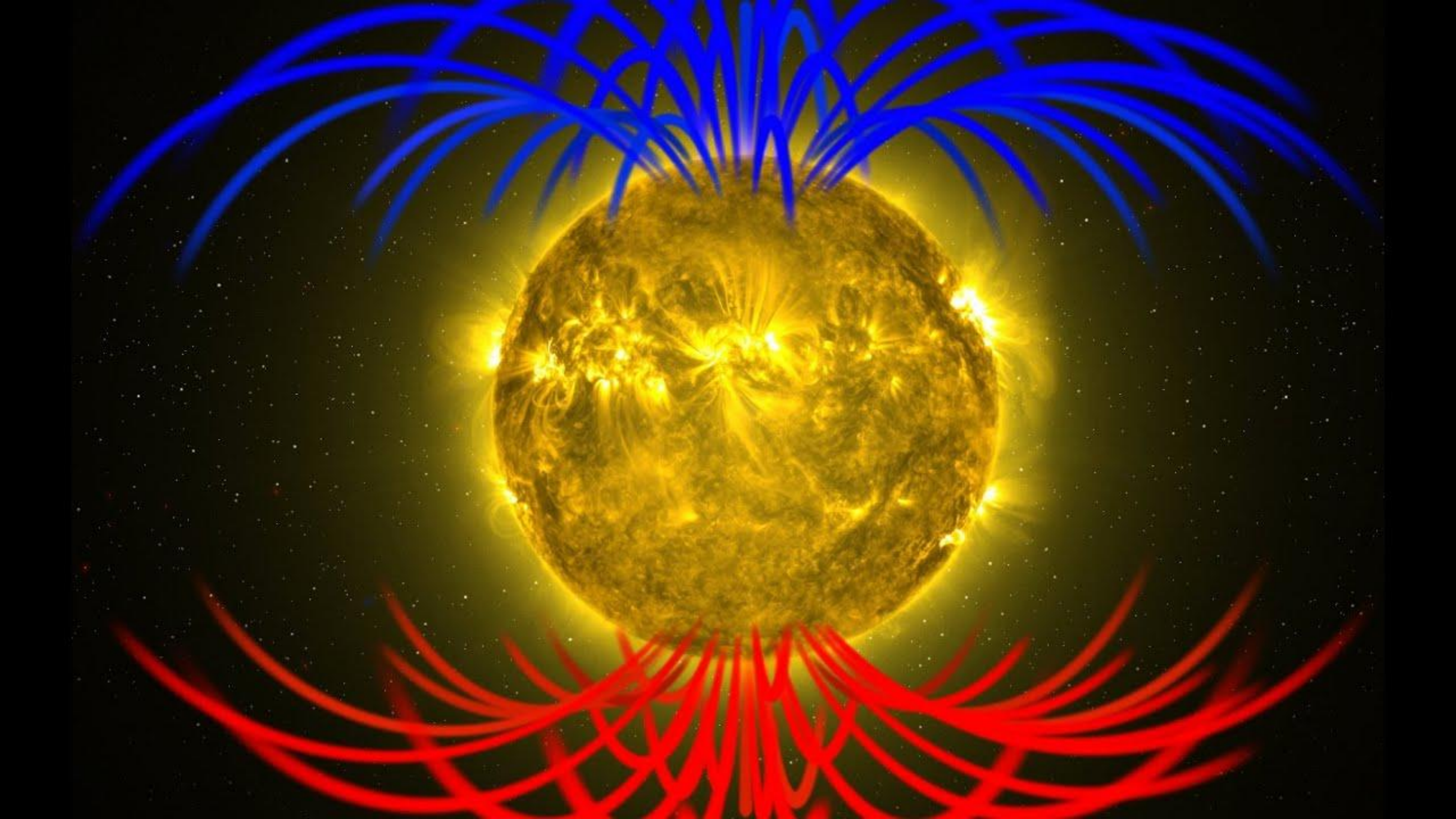

1
00:00:02,000 --> 00:00:05,290
[Man off screen] Try this one on for size,
our sun's north and south poles are about

2
00:00:05,290 --> 00:00:06,460
to flip flop.

3
00:00:06,460 --> 00:00:09,920
That's right if you were near the Sun and
had your compass pointing north the dial would

4
00:00:09,920 --> 00:00:11,870
actually swing south.

5
00:00:11,870 --> 00:00:15,960
Joining us today from the Goddard Space Flight
Center in Greenbelt Maryland is NASA Heliophysicist

6
00:00:15,960 --> 00:00:18,109
Dr. Alex Young, thanks for joining us.

7
00:00:18,109 --> 00:00:19,109
Alex: Good morning.

8
00:00:19,109 --> 00:00:21,180
[Man off screen] What is a magnetic field?

9
00:00:21,180 --> 00:00:22,490
And why do we study them?

10
00:00:22,490 --> 00:00:28,820
Alex: Well when you stick a magnet to a refrigerator,
that happens because of this invisible field

11
00:00:28,820 --> 00:00:30,360
called a magnetic field.

12
00:00:30,360 --> 00:00:37,130

The sun has a magnetic field also and the
Sun's magnetic field is incredibly complicated

13
00:00:37,130 --> 00:00:43,600
and dynamic and it drives all of the activity
that happens on the sun, space weather and

14
00:00:43,600 --> 00:00:45,050
solar storms.

15
00:00:45,050 --> 00:00:50,320
So we want to understand these magnetic fields
so that we can understand these storms why

16
00:00:50,320 --> 00:00:54,820
they happen and how powerful they could be.

17
00:00:54,820 --> 00:00:59,140
[Man off screen] What causes the Sun's magnetic
field to flip?

18
00:00:59,140 --> 00:01:05,039
Alex: Well inside the sun, it's not a solid
body, so it rotates at different speeds at

19
00:01:05,039 --> 00:01:12,080
different places and this generates magnetic
fields via something called a "solar dynamo".

20
00:01:12,080 --> 00:01:17,270
These magnetic fields are generated and they
increase in strength rising to the surface

21
00:01:17,270 --> 00:01:23,290
giving us sun spots, and this gives us the
solar activity that we're talking about.

22
00:01:23,290 --> 00:01:30,900
This whole process happens over a time scale
of roughly 11 years we call this the "solar

23
00:01:30,900 --> 00:01:32,060
cycle".

24
00:01:32,060 --> 00:01:39,270
The solar cycle goes from being very weak
with low activity to high activity and then

25
00:01:39,270 --> 00:01:40,810
back down to low activity.

26
00:01:40,810 --> 00:01:47,909
But what's exciting for us right now is that
we are near this peak of activity and what

27
00:01:47,909 --> 00:01:57,000
also happens with that is that the orientation
of the Sun's magnetic field reverses itself,

28
00:01:57,000 --> 00:01:58,360
switches places.

29
00:01:58,360 --> 00:02:04,560
And so this is what's happening right now
because we are near this solar maximum period.

30
00:02:04,560 --> 00:02:08,310
[Man off screen] What does this mean for the
Earth?

31
00:02:08,310 --> 00:02:16,360
Alex: Well, all of this activity, solar flares
(these bright flashes of light) or coronal

32
00:02:16,360 --> 00:02:20,370
mass ejections which are huge explosions of
material.

33
00:02:20,370 --> 00:02:25,230

They don't impact us directly but what they
do impact is our technology.

34
00:02:25,230 --> 00:02:31,150
They can cause temporary disruptions in our
communications, GPS, they can create a dangerous

35
00:02:31,150 --> 00:02:37,470
environment for astronauts in space, and they
can also cause disruptions in our power grid.

36
00:02:37,470 --> 00:02:43,510
Now the one good side about that is it also
gives us the aurora that we can see at the

37
00:02:43,510 --> 00:02:44,879
northern and southern poles.

38
00:02:44,879 --> 00:02:49,180
[Man off screen] Well where can we see more
great images of the sun and learn about the

39
00:02:49,180 --> 00:02:50,200
current solar cycle?

40
00:02:50,200 --> 00:02:54,940
Alex: Well a great place to go to find out
all about this and see all of the great data

41
00:02:54,940 --> 00:02:59,099
we have and imagery is at www.nasa.gov/sunearth.