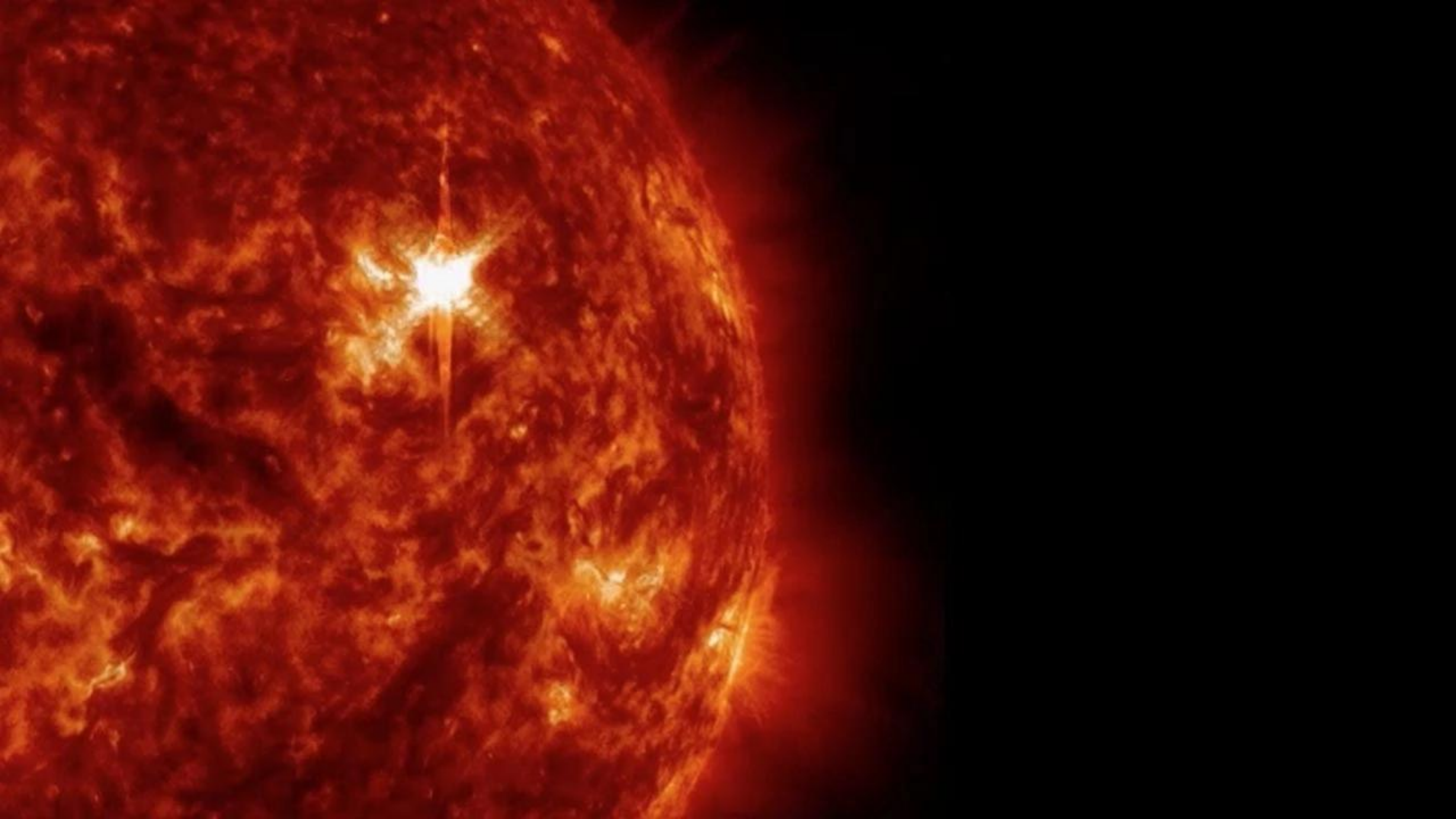

1
00:00:00,000 --> 00:00:04,030
music

2
00:00:08,070 --> 00:00:12,130
On March 29, 2014

3
00:00:12,150 --> 00:00:16,190
an X-class flare burst off the sun and vaulted into history.

4
00:00:16,210 --> 00:00:20,260
as the best observed flare of all time.

5
00:00:20,280 --> 00:00:24,280
The flare was witnessed by four different NASA observatories and one ground-based observatory.

6
00:00:24,300 --> 00:00:28,330
Each telescope captures a different aspect of the flare at a different

7
00:00:28,350 --> 00:00:32,380
height off the sun's surface. Working together, NASA's

8
00:00:32,400 --> 00:00:36,440
Heliophysics Fleet will help scientists better understand what sets off these

9
00:00:36,460 --> 00:00:40,590
large explosions on the sun.

10
00:00:40,610 --> 00:00:44,670
These images were taken using NASA's Solar Dynamics Observatory, or SDO.

11
00:00:44,690 --> 00:00:48,700
It specializes in capturing images of the entire sun at once.

12
00:00:48,720 --> 00:00:52,710
A close up shot captures some detail, but not at extremely high resolution.

13
00:00:52,730 --> 00:00:56,730

IRIS watches a range of layers in the sun's

14
00:00:56,750 --> 00:01:00,780
lower atmosphere. IRIS follows a well-planned schedule to

15
00:01:00,800 --> 00:01:04,810
observe small areas on the sun in high resolution.

16
00:01:04,830 --> 00:01:08,830
It was fortuitously pointed on this active region of the sun, in the hopes of catching a flare.

17
00:01:08,850 --> 00:01:12,870
This is the first X-class flare seen by the spacecraft.

18
00:01:12,890 --> 00:01:16,890
The RHESSI spacecraft can only see material at extreme temperatures.

19
00:01:16,910 --> 00:01:20,950
on the sun. To RHESSI, a flare looks like three pockets of

20
00:01:20,970 --> 00:01:24,990
heat in a triangle formation. There are two points on the bottom,

21
00:01:25,010 --> 00:01:29,010
showing foot points, and a third at the top of the flare.

22
00:01:29,030 --> 00:01:33,060
The Japan Aerospace Exploration Agency's and NASA's Hinode

23
00:01:33,080 --> 00:01:37,110
shows a series of layers in the sun's atmosphere. The images from Hinode's

24
00:01:37,130 --> 00:01:41,140
x-ray telescope show how material progresses from the lowest part of the

25
00:01:41,160 --> 00:01:45,170
atmosphere, called the chromosphere, upward through the heart of the flare,

26
00:01:45,190 --> 00:01:49,210
up to over three thousand miles above the surface.

27
00:01:49,230 --> 00:01:53,270
These images were captured by the National Solar Observatory's

28
00:01:53,290 --> 00:01:57,330
Dunn Solar Telescope in New Mexico.

29
00:01:57,350 --> 00:02:01,380
The telescope can watch only a small area at once, but it provides much higher resolution each area.

30
00:02:01,400 --> 00:02:05,440
The March 29th flare fortunately coincided with the best time of day

31
00:02:05,460 --> 00:02:09,510
for viewing from the ground.

32
00:02:09,530 --> 00:02:13,550
When combined, this comprehensive of one single flare will shed light on

33
00:02:13,570 --> 00:02:17,660
many future discoveries.