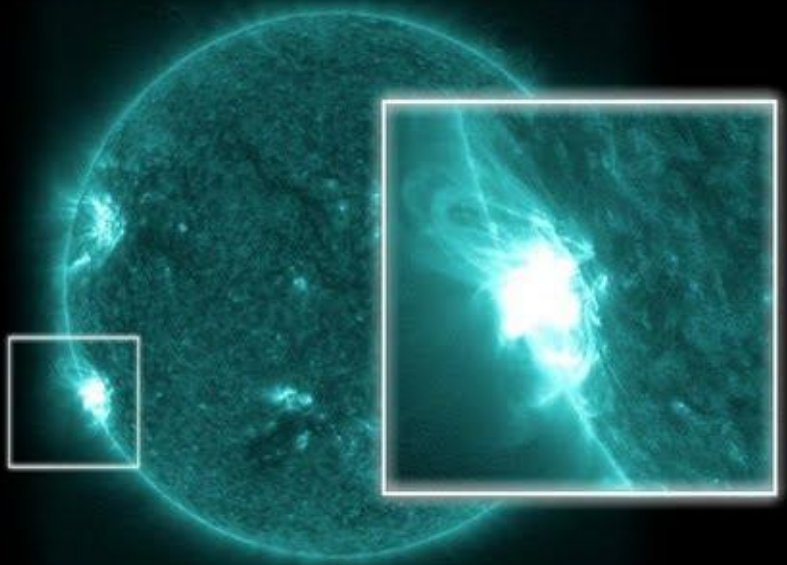

1
00:00:00,010 --> 00:00:04,110
(Music)

2
00:00:04,130 --> 00:00:08,280
On August 17,

3
00:00:08,300 --> 00:00:12,410
2011, the sun emitted a solar flare. Two of

4
00:00:12,430 --> 00:00:16,580
NASA's spavecraft, SDO and RHESSI witnessed the event. They saw

5
00:00:16,600 --> 00:00:20,700
more than jut the flare; they captured magnetic reconnection.

6
00:00:20,720 --> 00:00:24,740
Magnetic reconnection is when magnetic fields connect and disconnect,

7
00:00:24,760 --> 00:00:28,930
explosively transferring energy. Scientists believe magnetic

8
00:00:28,950 --> 00:00:33,060
reconnection drives almost every dynamic event on the sun, including

9
00:00:33,080 --> 00:00:37,240
solar flares. While we cannot see

10
00:00:37,260 --> 00:00:41,440
magnetic field lines, NASA's SDO can observe solar

11
00:00:41,460 --> 00:00:45,480
particles that move along them, tracing out giant arcades of magnetic loops

12
00:00:45,500 --> 00:00:49,570
on the sun's surface. Watch the magnetic structure in the background.

13
00:00:49,590 --> 00:00:53,690

The cusp flattens out on top. We see reconnection occur as an

14
00:00:53,710 --> 00:00:57,830
X shape begins to form and then splits - with half the solar material

15
00:00:57,850 --> 00:01:01,960
falling down and the other half escaping into space. A flare

16
00:01:01,980 --> 00:01:06,090
bursts from the arcade of loops, and reconnection propagates further down

17
00:01:06,110 --> 00:01:10,160
the arcade. The observation is verified by RHESSI data.

18
00:01:10,180 --> 00:01:14,200
RHESSI saw pockets of high temperatures above and below the loop.

19
00:01:14,220 --> 00:01:18,260
This signature arrangement indicates reconnection.

20
00:01:18,280 --> 00:01:22,330
The two data sets provide visual evidence of reconnection producing a solar

21
00:01:22,350 --> 00:01:26,530
flare and will help scientists understand the role magnetic reconnection

22
00:01:26,550 --> 00:01:30,610
plays in these amazing eruptions.