
science

1
00:00:10,230 --> 00:00:08,390
dark fireworks presented by science at

2
00:00:11,270 --> 00:00:10,240
nasa

3
00:00:13,110 --> 00:00:11,280
warning

4
00:00:15,110 --> 00:00:13,120
the movies you are about to see might

5
00:00:19,109 --> 00:00:15,120
make you feel uncomfortably close to the

6
00:00:21,189 --> 00:00:19,119
sun on june 7 2011 earth-orbiting

7
00:00:22,790 --> 00:00:21,199
satellites detected a flash of x-rays

8
00:00:24,390 --> 00:00:22,800
coming from the western edge of the

9
00:00:26,470 --> 00:00:24,400
solar disk

10
00:00:28,630 --> 00:00:26,480
registering only m for medium on the

11
00:00:30,550 --> 00:00:28,640
richter scale of solar flares

12
00:00:32,310 --> 00:00:30,560
the blast at first appeared to be a

13
00:00:34,389 --> 00:00:32,320

run-of-the-mill eruption

14
00:00:35,990 --> 00:00:34,399
that is until researchers looked at the

15
00:00:37,910 --> 00:00:36,000
movies

16
00:00:40,310 --> 00:00:37,920
we've never seen anything like it says

17
00:00:41,670 --> 00:00:40,320
young a solar physicist at goddard space

18
00:00:43,510 --> 00:00:41,680
flight center

19
00:00:45,670 --> 00:00:43,520
half of the sun appeared to be blowing

20
00:00:47,750 --> 00:00:45,680
itself to bits

21
00:00:49,750 --> 00:00:47,760
video beamed to earth by nasa's solar

22
00:00:52,549 --> 00:00:49,760
dynamics observatory revealed one of the

23
00:00:54,950 --> 00:00:52,559
most dramatic explosions ever

24
00:00:57,350 --> 00:00:54,960
in terms of raw power this really was

25
00:00:59,029 --> 00:00:57,360
just a medium-sized eruption says young

26
00:01:01,189 --> 00:00:59,039
but it had a uniquely dramatic

27
00:01:02,950 --> 00:01:01,199
appearance caused by all the inky dark

28
00:01:04,310 --> 00:01:02,960
material falling back to the stellar

29
00:01:06,710 --> 00:01:04,320
surface

30
00:01:09,109 --> 00:01:06,720
solar physicist angelos forlidas of the

31
00:01:11,030 --> 00:01:09,119
naval research lab calls it a case of

32
00:01:13,030 --> 00:01:11,040
dark fireworks

33
00:01:15,109 --> 00:01:13,040
the blast was triggered by an unstable

34
00:01:16,630 --> 00:01:15,119
magnetic filament near the sun's surface

35
00:01:18,630 --> 00:01:16,640
he explains

36
00:01:21,030 --> 00:01:18,640
that filament was loaded down with cool

37
00:01:22,950 --> 00:01:21,040
plasma which exploded in a spray of dark

38
00:01:25,429 --> 00:01:22,960

blobs and streamers

39
00:01:27,429 --> 00:01:25,439
the plasma blobs were as big as planets

40
00:01:29,350 --> 00:01:27,439
many larger than earth

41
00:01:31,109 --> 00:01:29,360
they rose and fell ballistically moving

42
00:01:33,350 --> 00:01:31,119
under the influence of the sun's gravity

43
00:01:35,030 --> 00:01:33,360
like balls tossed in the air exploding

44
00:01:36,310 --> 00:01:35,040
like bombs when they hit the stellar

45
00:01:38,390 --> 00:01:36,320
surface

46
00:01:39,670 --> 00:01:38,400
some blobs however were more like guided

47
00:01:41,590 --> 00:01:39,680
missiles

48
00:01:43,830 --> 00:01:41,600
in the movies we can see material

49
00:01:45,830 --> 00:01:43,840
grabbed by magnetic fields and funneled

50
00:01:47,830 --> 00:01:45,840
towards sunspot groups hundreds of

51
00:01:49,350 --> 00:01:47,840
thousands of kilometers away notes for

52
00:01:52,069 --> 00:01:49,360
lead us

53
00:01:54,789 --> 00:01:52,079
seo also detected a shadowy shockwave

54
00:01:56,789 --> 00:01:54,799
issuing from the blast site the solar

55
00:01:59,270 --> 00:01:56,799
tsunami propagated more than halfway

56
00:02:02,069 --> 00:01:59,280
across the sun visibly shaking filaments

57
00:02:04,149 --> 00:02:02,079
and loops of magnetism in route

58
00:02:06,310 --> 00:02:04,159
as remarkable as the june 7th eruption

59
00:02:09,190 --> 00:02:06,320
seems to be young believes it might not

60
00:02:11,110 --> 00:02:09,200
be so unusual in fact he says it could

61
00:02:12,949 --> 00:02:11,120
be downright common

62
00:02:15,510 --> 00:02:12,959
before the sharp-eyed solar dynamics

63
00:02:17,589 --> 00:02:15,520

observatory was launched in 2010

64
00:02:19,830 --> 00:02:17,599
space-based telescopes observed the sun

65
00:02:22,390 --> 00:02:19,840
with relatively slow cadences and or

66
00:02:24,470 --> 00:02:22,400
limited fields of view they could have

67
00:02:26,790 --> 00:02:24,480
easily missed the majesty of such an

68
00:02:28,869 --> 00:02:26,800
explosion catching only a single

69
00:02:31,030 --> 00:02:28,879
off-center snapshot at the beginning or

70
00:02:32,229 --> 00:02:31,040
end of the blast to hinted what actually

71
00:02:33,830 --> 00:02:32,239
happened

72
00:02:34,869 --> 00:02:33,840
could more dark fireworks be in the

73
00:02:38,150 --> 00:02:34,879
offing

74
00:02:40,309 --> 00:02:38,160
says young i wouldn't be a bit surprised