1
00:00:08,070 --> 00:00:05,190
a high energy outburst seen in april

2
00:00:09,910 --> 00:00:08,080
2020 confirmed the surprising range of

3
00:00:11,830 --> 00:00:09,920
super magnetized objects called

4
00:00:14,150 --> 00:00:11,840
magnetars

5
00:00:15,430 --> 00:00:14,160
this blast of x-rays and gamma rays

6
00:00:16,630 --> 00:00:15,440
triggered instruments on several

7
00:00:18,390 --> 00:00:16,640
spacecraft

8
00:00:21,029 --> 00:00:18,400
the eruption was over in the blink of an

9
00:00:23,910 --> 00:00:21,039
eye and originated from a galaxy about

10
00:00:25,750 --> 00:00:23,920
11 million light years away

11
00:00:28,710 --> 00:00:25,760
magnetars are part of the family of

12
00:00:31,189 --> 00:00:28,720
compact objects known as neutron stars

13
00:00:32,470 --> 00:00:31,199

the crushed leftover cores of exploded

14
00:00:34,630 --> 00:00:32,480
stars

15
00:00:37,270 --> 00:00:34,640
what makes magnetars special are their

16
00:00:39,350 --> 00:00:37,280
incredibly strong magnetic fields up to

17
00:00:41,110 --> 00:00:39,360
1 000 times stronger than a typical

18
00:00:42,869 --> 00:00:41,120
neutron stars

19
00:00:44,709 --> 00:00:42,879
sudden changes to this ultra strong

20
00:00:46,869 --> 00:00:44,719
field are thought to drive brief

21
00:00:48,549 --> 00:00:46,879
enormously powerful outbursts called

22
00:00:50,790 --> 00:00:48,559
giant flares

23
00:00:53,189 --> 00:00:50,800
one giant flare in our own galaxy

24
00:00:57,029 --> 00:00:53,199
affected earth's upper atmosphere from

25
00:01:00,310 --> 00:00:57,039
28 000 light years away

26
00:01:03,430 --> 00:01:00,320
on april 15th detectors on nasa's fermi

27
00:01:05,590 --> 00:01:03,440
swift mars odyssey and wind missions as

28
00:01:07,910 --> 00:01:05,600
well as on the european space agency's

29
00:01:10,390 --> 00:01:07,920
integral satellite picked up a rapid

30
00:01:12,550 --> 00:01:10,400
surge of x-rays and gamma rays

31
00:01:14,630 --> 00:01:12,560
using the arrival times of the signal at

32
00:01:18,149 --> 00:01:14,640
different spacecraft astronomers pinned

33
00:01:19,749 --> 00:01:18,159
the burst to ngc 253 a bright nearby

34
00:01:21,830 --> 00:01:19,759
galaxy

35
00:01:24,950 --> 00:01:21,840
from start to finish the event lasted

36
00:01:26,870 --> 00:01:24,960
just 140 milliseconds as fast as a

37
00:01:29,749 --> 00:01:26,880
finger snap

38
00:01:31,270 --> 00:01:29,759

astronomers see gamma-ray bursts or grbs

39
00:01:32,710 --> 00:01:31,280
almost every day

40
00:01:35,030 --> 00:01:32,720
we know that at least some of the

41
00:01:37,590 --> 00:01:35,040
shortest grbs come from merging neutron

42
00:01:38,870 --> 00:01:37,600
stars more than 100 million light years

43
00:01:41,190 --> 00:01:38,880
away

44
00:01:44,310 --> 00:01:41,200
the april blast initially looked similar

45
00:01:46,389 --> 00:01:44,320
to these events but a grb located in our

46
00:01:48,469 --> 00:01:46,399
own galactic neighborhood should have

47
00:01:50,550 --> 00:01:48,479
appeared much brighter

48
00:01:52,789 --> 00:01:50,560
as astronomers explored this new burst

49
00:01:56,069 --> 00:01:52,799
in detail they found it looked less like

50
00:01:58,069 --> 00:01:56,079
a short grb and more like a magnetar

51
00:01:59,830 --> 00:01:58,079
giant flare

52
00:02:02,310 --> 00:01:59,840
astronomers have recorded two such

53
00:02:04,310 --> 00:02:02,320
flares inside our own galaxy and a third

54
00:02:06,550 --> 00:02:04,320
in a satellite galaxy

55
00:02:09,430 --> 00:02:06,560
all of these bursts displayed a spiky

56
00:02:11,670 --> 00:02:09,440
tail as they fade it out the spikes form

57
00:02:14,309 --> 00:02:11,680
as the flare's hot spot spins in and out

58
00:02:16,070 --> 00:02:14,319
of view like a lighthouse beam

59
00:02:17,670 --> 00:02:16,080
current instruments can't detect this

60
00:02:18,949 --> 00:02:17,680
feature in flares located at great

61
00:02:21,190 --> 00:02:18,959
distances

62
00:02:23,670 --> 00:02:21,200
but other characteristics such as their

63
00:02:26,869 --> 00:02:23,680

extremely fast rise in brightness are

64
00:02:28,630 --> 00:02:26,879
unmatched by short grbs

65
00:02:31,110 --> 00:02:28,640
this fueled astronomers growing

66
00:02:33,270 --> 00:02:31,120
suspicions that short grbs associated

67
00:02:37,110 --> 00:02:33,280
with galaxies in our neighborhood might

68
00:02:39,830 --> 00:02:37,120
really be magnetar giant flares now the

69
00:02:42,229 --> 00:02:39,840
precise localization of the 2020 event

70
00:02:44,070 --> 00:02:42,239
to the disk of the sculptor galaxy has

71
00:02:46,550 --> 00:02:44,080
unmasked them at last

72
00:02:49,430 --> 00:02:46,560
astronomers suspect that a few percent

73
00:02:50,869 --> 00:02:49,440
of observed short grbs may in fact be

74
00:02:52,869 --> 00:02:50,879
giant flares

75
00:02:54,070 --> 00:02:52,879
high-powered eruptions in our galactic

76
00:02:56,790 --> 00:02:54,080
backyard