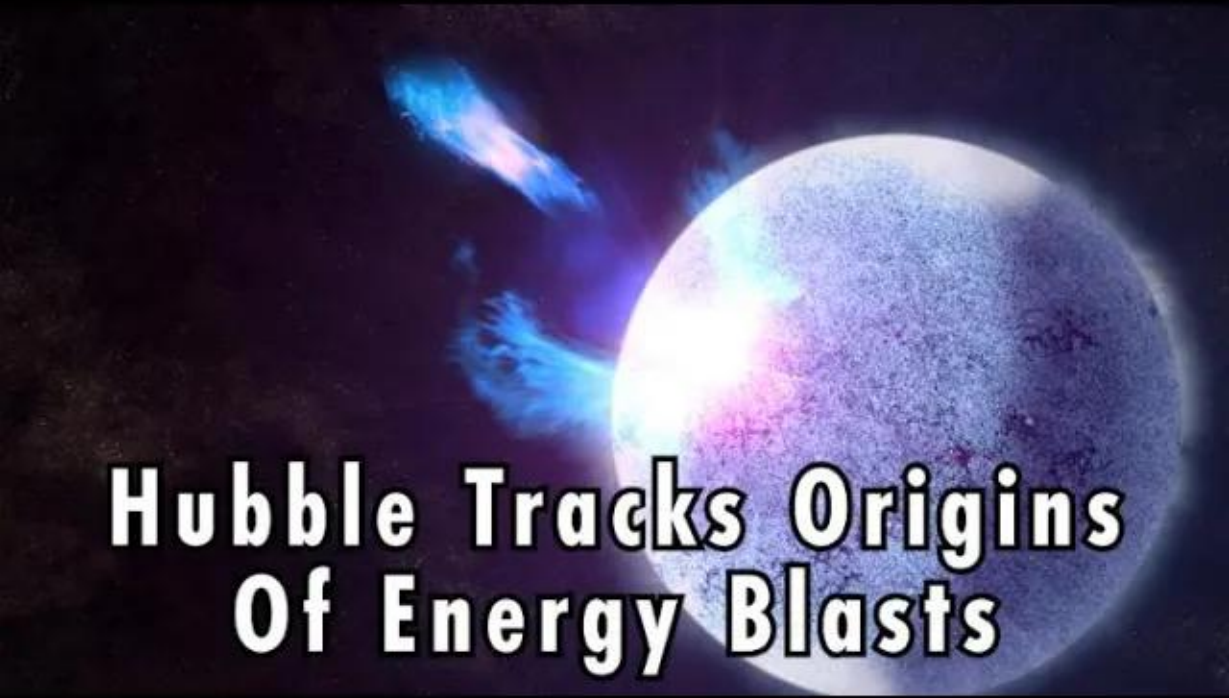
Hubble Tracks Origins
Of Energy Blasts

1
00:00:05,670 --> 00:00:03,429
fast radio bursts or frbs are

2
00:00:08,150 --> 00:00:05,680
extraordinary events that generate as

3
00:00:11,830 --> 00:00:08,160
much energy in a thousandth of a second

4
00:00:14,070 --> 00:00:11,840
as the sun does in an entire year

5
00:00:16,390 --> 00:00:14,080
astronomers using nasa's hubble space

6
00:00:19,109 --> 00:00:16,400
telescope have traced the locations of

7
00:00:22,790 --> 00:00:19,119
five brief powerful radio blasts to the

8
00:00:25,189 --> 00:00:22,800
spiral arms of five distant galaxies

9
00:00:27,349 --> 00:00:25,199
because these radio pulses disappear in

10
00:00:29,109 --> 00:00:27,359
much less than the blink of an eye

11
00:00:30,870 --> 00:00:29,119
researchers have had a hard time

12
00:00:32,310 --> 00:00:30,880
tracking down where they come from and

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

what causes them

14
00:00:36,549 --> 00:00:34,399
locating the galaxies where these blasts

15
00:00:38,869 --> 00:00:36,559
originate is important in determining

16
00:00:41,430 --> 00:00:38,879
what astronomical events trigger such

17
00:00:43,350 --> 00:00:41,440
intense flashes of energy

18
00:00:45,590 --> 00:00:43,360
the hubble space telescope helped

19
00:00:47,670 --> 00:00:45,600
researchers narrow the list of possible

20
00:00:49,670 --> 00:00:47,680
frb sources

21
00:00:53,189 --> 00:00:49,680
since their discovery astronomers have

22
00:00:55,430 --> 00:00:53,199
uncovered up to 1000 frbs but only about

23
00:00:57,270 --> 00:00:55,440
15 are associated with particular

24
00:00:59,590 --> 00:00:57,280
galaxies

25
00:01:01,510 --> 00:00:59,600
in this new hubble study of frbs

26
00:01:03,349 --> 00:01:01,520
astronomers pinpointed where those

27
00:01:05,670 --> 00:01:03,359
bursts occurred within their specific

28
00:01:08,149 --> 00:01:05,680
galaxies

29
00:01:10,630 --> 00:01:08,159
these images display a range of spiral

30
00:01:13,109 --> 00:01:10,640
arm structures from tightly wound to

31
00:01:14,789 --> 00:01:13,119
more open revealing how stars are

32
00:01:16,550 --> 00:01:14,799
distributed along these prominent

33
00:01:18,710 --> 00:01:16,560
features

34
00:01:20,710 --> 00:01:18,720
these clues helped researchers rule out

35
00:01:22,390 --> 00:01:20,720
some of the possible stellar objects

36
00:01:25,030 --> 00:01:22,400
originally thought to cause these

37
00:01:26,950 --> 00:01:25,040
brilliant flares including the explosive

38
00:01:29,590 --> 00:01:26,960

deaths of the youngest most massive

39
00:01:32,069 --> 00:01:29,600
stars which create gamma-ray bursts and

40
00:01:34,550 --> 00:01:32,079
some type of supernova

41
00:01:37,429 --> 00:01:34,560
another unlikely source is the merger of

42
00:01:39,270 --> 00:01:37,439
neutron stars the crushed cores of stars

43
00:01:40,710 --> 00:01:39,280
that end their lives in supernova

44
00:01:42,870 --> 00:01:40,720
explosions

45
00:01:44,950 --> 00:01:42,880
these mergers take billions of years to

46
00:01:47,670 --> 00:01:44,960
occur and are usually far from the

47
00:01:49,429 --> 00:01:47,680
spiral arms of older galaxies that no

48
00:01:51,830 --> 00:01:49,439
longer form stars

49
00:01:54,069 --> 00:01:51,840
this study suggests that frbs do not

50
00:01:57,109 --> 00:01:54,079
originate from the youngest most massive

51
00:02:00,149 --> 00:01:57,119
stars or from older stars in a galaxy's

52
00:02:02,389 --> 00:02:00,159
central bulge however it is consistent

53
00:02:06,230 --> 00:02:02,399
with the leading model that frbs

54
00:02:08,469 --> 00:02:06,240
originate from young magnetar outbursts

55
00:02:11,510 --> 00:02:08,479
magnetars are a type of neutron star

56
00:02:13,510 --> 00:02:11,520
with powerful magnetic fields called the

57
00:02:16,150 --> 00:02:13,520
strongest magnets in the universe

58
00:02:18,550 --> 00:02:16,160
magnetars possess a magnetic field 10

59
00:02:20,949 --> 00:02:18,560
trillion times more powerful than the

60
00:02:23,510 --> 00:02:20,959
magnets on your refrigerator door

61
00:02:25,750 --> 00:02:23,520
these magnetic fields lead to flares and

62
00:02:27,350 --> 00:02:25,760
magnetic processes that can emit radio

63
00:02:29,510 --> 00:02:27,360

light

64
00:02:31,509 --> 00:02:29,520
although the hubble results are exciting

65
00:02:33,990 --> 00:02:31,519
researchers need more observations to

66
00:02:35,350 --> 00:02:34,000
better pinpoint the source of frbs so

67
00:02:39,190 --> 00:02:35,360
they can develop a stronger

68
00:02:41,350 --> 00:02:39,200
understanding of these enigmatic flashes

69
00:02:43,910 --> 00:02:41,360
this field of study may need a lot more

70
00:02:45,830 --> 00:02:43,920
research but thanks to observations made

71
00:02:47,830 --> 00:02:45,840
with the hubble space telescope we're