



Hubble Reveals Ultra-Relativistic Jet

1
00:00:05,030 --> 00:00:02,690
astronomers using NASA's Hubble Space

2
00:00:06,950 --> 00:00:05,040
Telescope have found a jet propelled

3
00:00:09,230 --> 00:00:06,960
through space at nearly the speed of

4
00:00:11,450 --> 00:00:09,240
light but the Titanic collision between

5
00:00:13,970 --> 00:00:11,460
two neutron stars which are the

6
00:00:15,770 --> 00:00:13,980
collapsed cores of massive supergiant

7
00:00:18,470 --> 00:00:15,780
stars

8
00:00:22,490 --> 00:00:18,480
the explosive event observed on August

9
00:00:24,650 --> 00:00:22,500
17 2017 was the first combined detection

10
00:00:27,050 --> 00:00:24,660
of gravitational waves and gamma

11
00:00:28,849 --> 00:00:27,060
radiation from the merger of binary

12
00:00:31,370 --> 00:00:28,859
neutron stars

13
00:00:33,229 --> 00:00:31,380

this discovery prompted scientists to

14

00:00:34,370 --> 00:00:33,239

quickly aim Hubble at the site of the

15

00:00:37,250 --> 00:00:34,380

explosion

16

00:00:39,770 --> 00:00:37,260

a total of 70 observatories around the

17

00:00:42,290 --> 00:00:39,780

globe and in space collectively gathered

18

00:00:44,450 --> 00:00:42,300

data across the electromagnetic spectrum

19

00:00:46,610 --> 00:00:44,460

of the mergers aftermath

20

00:00:49,190 --> 00:00:46,620

astronomers used Hubble's capabilities

21

00:00:51,350 --> 00:00:49,200

to precisely measure the position and

22

00:00:53,450 --> 00:00:51,360

movements of the explosion's Shockwave

23

00:00:55,610 --> 00:00:53,460

they were trying to see how the

24

00:00:58,549 --> 00:00:55,620

shockwave's physical properties changed

25

00:01:00,709 --> 00:00:58,559

over time combining Hubble observations

26

00:01:02,930 --> 00:01:00,719

with that of several other telescopes

27

00:01:05,690 --> 00:01:02,940

allowed researchers to pinpoint the

28

00:01:06,590 --> 00:01:05,700

explosion site 130 million light years

29

00:01:09,170 --> 00:01:06,600

away

30

00:01:12,230 --> 00:01:09,180

the data suggests the blast shock waves

31

00:01:14,810 --> 00:01:12,240

traveled along a narrow beam confined by

32

00:01:17,630 --> 00:01:14,820

powerful magnetic fields the resulting

33

00:01:19,609 --> 00:01:17,640

Jets smashed into and swept up material

34

00:01:22,550 --> 00:01:19,619

in the surrounding interstellar medium

35

00:01:24,649 --> 00:01:22,560

this material included a mass radiation

36

00:01:26,929 --> 00:01:24,659

through which the jet emerged

37

00:01:29,149 --> 00:01:26,939

as the jet moved away from the site of

38

00:01:32,149 --> 00:01:29,159

the explosion the mass moved outward

39

00:01:35,149 --> 00:01:32,159

this work paves the way for more precise

40

00:01:37,310 --> 00:01:35,159

studies of neutron star mergers more

41

00:01:40,690 --> 00:01:37,320

observations like this one help us

42

00:01:42,830 --> 00:01:40,700

understand more about the universe