
NASA
Hubble's Inside The Image
N44 Superbubble

1
00:00:00,299 --> 00:00:04,440
foreign

2
00:00:13,249 --> 00:00:10,330
[Music]

3
00:00:17,510 --> 00:00:13,259
four is what's called an emission nebula

4
00:00:20,029 --> 00:00:17,520
it has this bright glowing gases that

5
00:00:22,310 --> 00:00:20,039
you see here it's in What's called the

6
00:00:25,310 --> 00:00:22,320
large magellanic cloud

7
00:00:27,410 --> 00:00:25,320
this image is about a thousand light

8
00:00:29,630 --> 00:00:27,420
years across so it's a fairly large

9
00:00:32,749 --> 00:00:29,640
nebula this Dark Void in the center is

10
00:00:35,450 --> 00:00:32,759
about 250 light years across and that is

11
00:00:37,069 --> 00:00:35,460
something called a Super Bubble area in

12
00:00:39,530 --> 00:00:37,079
the nebula it's been completely cleared

13
00:00:41,810 --> 00:00:39,540

out all around it we have dust and gas

14
00:00:45,110 --> 00:00:41,820
at various temperatures various

15
00:00:47,869 --> 00:00:45,120
densities inside of that bubble we only

16
00:00:49,850 --> 00:00:47,879
have what's called ionized gas it's very

17
00:00:51,950 --> 00:00:49,860
hot gas

18
00:00:53,930 --> 00:00:51,960
one of the puzzles in this image or

19
00:00:54,950 --> 00:00:53,940
competing ideas and they're probably

20
00:00:57,290 --> 00:00:54,960
both

21
00:01:00,770 --> 00:00:57,300
contributing here neither one seems to

22
00:01:04,009 --> 00:01:00,780
be the ultimate solution one is that the

23
00:01:07,250 --> 00:01:04,019
Winds of stars inside the void which

24
00:01:09,950 --> 00:01:07,260
include high energy high speed particles

25
00:01:12,350 --> 00:01:09,960
coming out from the surface of the Stars

26
00:01:14,270 --> 00:01:12,360
pushing material clearing it out of the

27
00:01:15,950 --> 00:01:14,280
center the other possibility or the

28
00:01:19,609 --> 00:01:15,960
other thing that's probably contributing

29
00:01:21,070 --> 00:01:19,619
to the clearing of this Super Bubble is

30
00:01:26,450 --> 00:01:21,080
supernova

31
00:01:28,749 --> 00:01:26,460
they're massive stars explode which

32
00:01:31,670 --> 00:01:28,759
sends out both particles and radiation

33
00:01:34,070 --> 00:01:31,680
these particle waves that are coming out

34
00:01:37,270 --> 00:01:34,080
can act as a snow plow and basically

35
00:01:40,010 --> 00:01:37,280
clear out the the void and push it up

36
00:01:42,830 --> 00:01:40,020
against this outer Ridge that we see

37
00:01:45,410 --> 00:01:42,840
here if these are happening you should

38
00:01:47,390 --> 00:01:45,420

see around this border stars in the

39
00:01:50,090 --> 00:01:47,400
process of formation and in fact we do

40
00:01:52,429 --> 00:01:50,100
see stars there and there are about five

41
00:01:54,889 --> 00:01:52,439
million years different in age than the

42
00:01:57,590 --> 00:01:54,899
stars that are inside they have formed

43
00:02:00,170 --> 00:01:57,600
later after this compression has

44
00:02:03,649 --> 00:02:00,180
happened from the clearing of the inside

45
00:02:06,109 --> 00:02:03,659
it is still expanding not not super fast

46
00:02:08,449 --> 00:02:06,119
it appears that the near Edge is coming

47
00:02:10,969 --> 00:02:08,459
toward us at about 45 kilometers per

48
00:02:13,070 --> 00:02:10,979
second the far Edge is receding at maybe

49
00:02:14,930 --> 00:02:13,080
30. so it's asymmetric which is

50
00:02:17,210 --> 00:02:14,940
interesting it's moving a little faster

51
00:02:19,369 --> 00:02:17,220
on one side than the other it's called

52
00:02:21,170 --> 00:02:19,379
the Super Bubble because of its size if

53
00:02:23,570 --> 00:02:21,180
we go to smaller and smaller bubbles

54
00:02:26,390 --> 00:02:23,580
they become more and more frequent to

55
00:02:29,089 --> 00:02:26,400
see a volume of space this large that

56
00:02:32,210 --> 00:02:29,099
has been cleared out so completely is