



1
00:00:02,610 --> 00:00:15,910

[Music]

2
00:00:19,750 --> 00:00:17,830
when we look up at the night sky we can

3
00:00:21,670 --> 00:00:19,760
only see a small percentage of the stars

4
00:00:28,710 --> 00:00:21,680
that are around us that's because our

5
00:00:32,229 --> 00:00:30,470
telescopes on earth have helped us get a

6
00:00:34,310 --> 00:00:32,239
better view of the stars by collecting

7
00:00:40,709 --> 00:00:34,320
more light than our eyes can see

8
00:00:44,950 --> 00:00:42,630
but the view from those telescopes gets

9
00:00:48,830 --> 00:00:44,960
distorted by earth's atmosphere that's

10
00:00:48,840 --> 00:00:53,029
[Music]

11
00:00:57,350 --> 00:00:54,630
to get rid of the distortion of the

12
00:00:59,990 --> 00:00:57,360
atmosphere astronomers imagine building

13
00:01:02,150 --> 00:01:00,000

a telescope the size of a school bus to

14

00:01:03,990 --> 00:01:02,160

go into space

15

00:01:08,130 --> 00:01:04,000

the result was the hubble space

16

00:01:09,910 --> 00:01:08,140

telescope launched in 1990

17

00:01:12,870 --> 00:01:09,920

[Music]

18

00:01:15,780 --> 00:01:12,880

today it orbits the earth 340 miles

19

00:01:15,790 --> 00:01:19,350

[Music]

20

00:01:23,270 --> 00:01:21,350

many of the galaxy's hubble photographs

21

00:01:25,530 --> 00:01:23,280

are millions of light years away from

22

00:01:29,749 --> 00:01:25,540

earth

23

00:01:31,190 --> 00:01:29,759

[Music]

24

00:01:33,510 --> 00:01:31,200

light years are a measurement for

25

00:01:35,590 --> 00:01:33,520

distance in space related to the time it

26
00:01:37,749 --> 00:01:35,600
takes light to travel from one place to

27
00:01:40,789 --> 00:01:37,759
another a light year is the distance

28
00:01:43,030 --> 00:01:40,799
light travels in one year

29
00:01:45,510 --> 00:01:43,040
hubble photographed the whirlpool galaxy

30
00:01:46,750 --> 00:01:45,520
that is 25 million light years away from

31
00:01:50,469 --> 00:01:46,760
earth

32
00:01:55,350 --> 00:01:53,109
the light from that galaxy took 25

33
00:01:57,109 --> 00:01:55,360
million years to travel to earth

34
00:02:00,069 --> 00:01:57,119
this means that the light hubble sees

35
00:02:02,230 --> 00:02:00,079
from the whirlpool galaxy is 25 million

36
00:02:05,749 --> 00:02:02,240
years old

37
00:02:09,190 --> 00:02:07,670
we aren't seeing the galaxy as it exists

38
00:02:12,309 --> 00:02:09,200

today

39

00:02:23,589 --> 00:02:12,319

we're seeing the galaxy as it existed 25

40

00:02:28,070 --> 00:02:25,589

a hubble astronomer had a really

41

00:02:30,550 --> 00:02:28,080

interesting idea to point hubble at an

42

00:02:35,430 --> 00:02:30,560

apparently blank spot of sky

43

00:02:40,390 --> 00:02:37,589

that empty patch of sky

44

00:02:42,309 --> 00:02:40,400

turned out to be filled with galaxies

45

00:02:43,350 --> 00:02:42,319

much more distant than we'd ever seen

46

00:02:45,910 --> 00:02:43,360

before

47

00:02:47,910 --> 00:02:45,920

some of the galaxies were baby galaxies

48

00:02:51,830 --> 00:02:47,920

born just after the creation of the

49

00:02:53,990 --> 00:02:51,840

universe in the big bang

50

00:02:56,070 --> 00:02:54,000

[Music]

51
00:02:58,070 --> 00:02:56,080
the universe is a never-ending source of

52
00:02:59,990 --> 00:02:58,080
wonder largely because of the things the

53
00:03:06,790 --> 00:03:00,000
hubble space telescope has taught us

54
00:03:12,869 --> 00:03:09,509
hubble studies our own solar system

55
00:03:16,550 --> 00:03:12,879
like storms on mars

56
00:03:16,560 --> 00:03:20,710
and aurora on jupiter

57
00:03:25,380 --> 00:03:22,550
hubble also photographs the birth and

58
00:03:28,869 --> 00:03:25,390
death of stars

59
00:03:30,710 --> 00:03:28,879
[Music]

60
00:03:32,540 --> 00:03:30,720
and has uncovered thousands of new

61
00:03:52,070 --> 00:03:32,550
galaxies in the universe