1
00:00:00,000 --> 00:00:01,902
[rock music]

2
00:00:01,902 --> 00:00:05,038
The Guardians of the Galaxy may
have some skills at protecting

3
00:00:05,038 --> 00:00:08,742
the universe from bad guys, but
the Hubble Space Telescope also

4
00:00:08,742 --> 00:00:12,079
has some amazing superpowers
when it comes to observing

5
00:00:12,079 --> 00:00:16,116
galaxies. A galaxy is an
enormous collection of billions

6
00:00:16,116 --> 00:00:19,286
or trillions of stars and other
matter that is gravitationally

7
00:00:19,286 --> 00:00:22,422
held together. Most of the
individual stars you see with

8
00:00:22,422 --> 00:00:25,926
the naked eye are in our own
galaxy, the Milky Way, but if

9
00:00:25,926 --> 00:00:28,996
you use a telescope like Hubble
that can see fainter objects,

10
00:00:28,996 --> 00:00:33,300
you can spot other galaxies in
all sorts of configurations. For

11

00:00:33,300 --> 00:00:36,570
Hubble’s 27th birthday this
April, we released this new

12
00:00:36,570 --> 00:00:39,940
image of two spiral galaxies
that are about 55 million

13
00:00:39,940 --> 00:00:43,243
light-years away. The galaxy on
the right is viewed almost

14
00:00:43,243 --> 00:00:46,513
face-on at a slight angle, and
the galaxy on the left is viewed

15
00:00:46,513 --> 00:00:50,484
edge on. They’re very pretty,
but it would be too easy to

16
00:00:50,484 --> 00:00:53,854
guard just two galaxies. Check
out this brand new Frontier

17
00:00:53,854 --> 00:00:57,658
Fields image showing thousands
of galaxies using two combined

18
00:00:57,658 --> 00:01:00,861
superpowers - Hubble’s
incredible optics above Earth’s

19
00:01:00,861 --> 00:01:04,331
atmosphere, and a quirk of
nature called gravitational

20
00:01:04,331 --> 00:01:08,602
lensing. The enormous mass of a
cluster of galaxies is warping

21

00:01:08,602 --> 00:01:12,372
space in a way that acts as a
lens that magnifies, brightens,

22
00:01:12,372 --> 00:01:16,343
and distorts the light from
galaxies behind it. The galaxies

23
00:01:16,343 --> 00:01:20,047
in cluster Abell 370 are the
bright yellowish white smudges,

24
00:01:20,047 --> 00:01:23,884
and they’re about 4 billion
light-years away. Most of the

25
00:01:23,884 --> 00:01:26,853
other smudges are background
galaxies being gravitationally

26
00:01:26,853 --> 00:01:30,023
lensed by the galaxy cluster,
and some of them you can see are

27
00:01:30,023 --> 00:01:33,593
incredibly distorted, like this
dragon-shaped feature, which

28
00:01:33,593 --> 00:01:36,863
seems like a monster straight
out of a comic book but is

29
00:01:36,863 --> 00:01:40,567
actually a single spiral galaxy
appearing in multiple locations

30
00:01:40,567 --> 00:01:44,705
next to each other in an arc.
One of the farthest galaxies in

31

00:01:44,705 --> 00:01:48,875
this image is this little red
dot, which is over 13 billion

32
00:01:48,875 --> 00:01:52,346
light-years away, and it appears
in multiple locations from the

33
00:01:52,346 --> 00:01:56,516
distortion of the gravitational
lens. We're seeing this galaxy

34
00:01:56,516 --> 00:02:01,388
as it appeared only 600 million
years after the Big Bang. The

35
00:02:01,388 --> 00:02:04,257
Hubble Space Telescope is
helping keep watch over many,

36
00:02:04,257 --> 00:02:08,528
many galaxies, so if we spot any
trouble going down in a far

37
00:02:08,528 --> 00:02:11,598
corner of the universe, we'll be
sure to let Star-Lord and his

38
00:02:11,598 --> 00:02:12,332
team know.