

grav•i•ta•tion•al
lens•ing



1
00:00:00,133 --> 00:00:01,533
Gravitational lensing.

2
00:00:01,533 --> 00:00:04,433
Look at the Webb telescope's
first deep field image and you may notice

3
00:00:04,433 --> 00:00:06,800
some galaxies that are stretched
or banana shaped.

4
00:00:07,166 --> 00:00:09,900
They're not actually shaped like this.
So what makes them look like it?

5
00:00:10,333 --> 00:00:11,966
Gravitational lensing.

6
00:00:11,966 --> 00:00:15,433
Gravitational lensing occurs
when a celestial object has such a massive

7
00:00:15,433 --> 00:00:18,700
gravitational pull that it actually warps
the time and space around it.

8
00:00:19,433 --> 00:00:21,533
Imagine placing a ball
on a piece of squishy foam.

9
00:00:21,800 --> 00:00:22,766
The fabric of space --

10
00:00:22,766 --> 00:00:26,166
the foam -- sinks down
around the celestial object -- the ball.

11
00:00:26,166 --> 00:00:28,133
And light that would otherwise travel

in a straight line

12

00:00:28,133 --> 00:00:31,833

follows the bend of the warped space,
distorting and brightening light

13

00:00:31,833 --> 00:00:35,100

from behind the celestial object
-- a galaxy cluster in this case.

14

00:00:35,666 --> 00:00:36,900

So why do we care?

15

00:00:36,900 --> 00:00:38,033

Well, because with a natural

16

00:00:38,033 --> 00:00:41,000

magnifying glass,
we can see even more distant objects.

17

00:00:41,266 --> 00:00:43,400

In Webb's first deep field here,
the banana shaped

18

00:00:43,400 --> 00:00:47,066

galaxies are actually much farther away
than the galaxies in the central cluster.

19

00:00:47,266 --> 00:00:49,666

We see them as stretched
because their light is being warped

20

00:00:49,666 --> 00:00:51,866

and magnified by the galaxy clusters
in front of them.