



HUBBLE SCIENCE

DARK ENERGY **A Mysterious Force**

1
00:00:18,310 --> 00:00:16,390
because the hubble space telescope is

2
00:00:20,630 --> 00:00:18,320
operating so well and is so

3
00:00:23,349 --> 00:00:20,640
scientifically effective right now

4
00:00:25,349 --> 00:00:23,359
scientists are using hubble to

5
00:00:28,630 --> 00:00:25,359
investigate some of the deepest

6
00:00:31,269 --> 00:00:28,640
mysteries of the universe

7
00:00:33,350 --> 00:00:31,279
one mystery is dark energy that's the

8
00:00:35,110 --> 00:00:33,360
name just kind of plastered on this

9
00:00:37,590 --> 00:00:35,120
phenomenon that hubble and other

10
00:00:39,830 --> 00:00:37,600
telescopes together we found that the

11
00:00:42,709 --> 00:00:39,840
universe expansion has been accelerating

12
00:00:45,430 --> 00:00:42,719
for the last few billion years well what

13
00:00:47,190 --> 00:00:45,440

is causing that we don't know it's

14

00:00:49,830 --> 00:00:47,200

something about

15

00:00:52,069 --> 00:00:49,840

a repulsive force that we may not fully

16

00:00:53,590 --> 00:00:52,079

understand or new physics that we don't

17

00:00:56,310 --> 00:00:53,600

fully understand

18

00:00:58,389 --> 00:00:56,320

but hubble was used along in complement

19

00:01:00,709 --> 00:00:58,399

with some telescopes on the ground to

20

00:01:03,510 --> 00:01:00,719

determine that the expansion of the

21

00:01:05,750 --> 00:01:03,520

universe is in fact accelerating by

22

00:01:07,590 --> 00:01:05,760

something we're now calling dark energy

23

00:01:10,230 --> 00:01:07,600

and without hubble we would have not

24

00:01:17,030 --> 00:01:10,240

been able to make this detection which

25

00:01:20,550 --> 00:01:18,630

this explains why the universe appears

26

00:01:23,190 --> 00:01:20,560

to be accelerating now when it used to

27

00:01:25,270 --> 00:01:23,200

be slowing down because of gravity so

28

00:01:27,190 --> 00:01:25,280

now the question is well is this a

29

00:01:28,870 --> 00:01:27,200

simple story or is it complicated is

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00:01:30,710 --> 00:01:28,880

there more than one kind of dark energy

31

00:01:34,950 --> 00:01:30,720

has the dark energy itself changed over

32

00:01:40,469 --> 00:01:37,910

so hubble is now being used to refine

33

00:01:43,190 --> 00:01:40,479

even further that expansion rate of the

34

00:01:45,350 --> 00:01:43,200

universe in our current epoch

35

00:01:47,350 --> 00:01:45,360

and trying to compare that to what might

36

00:01:48,870 --> 00:01:47,360

be predicted from looking at other

37

00:01:50,069 --> 00:01:48,880

measurements of the universe with other

38

00:01:51,910 --> 00:01:50,079

telescopes

39

00:01:53,429 --> 00:01:51,920

right now we're finding a discrepancy

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00:01:55,350 --> 00:01:53,439

between what we might have expected and

41

00:01:57,910 --> 00:01:55,360

what we're actually measuring so that's

42

00:02:00,149 --> 00:01:57,920

one realm where hubble is really at the

43

00:02:02,870 --> 00:02:00,159

cutting edge of helping us understand or