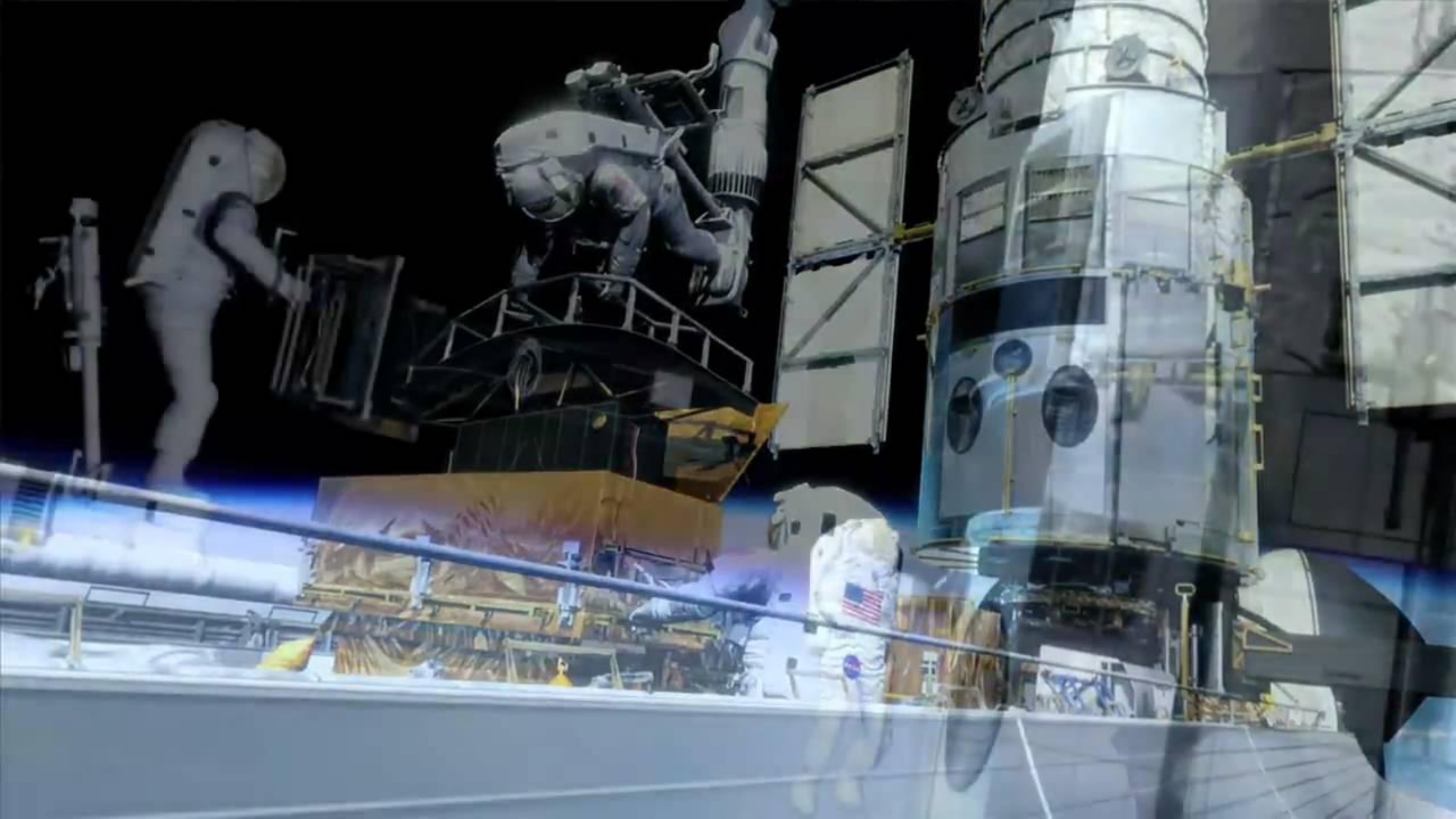

1
00:00:14,709 --> 00:00:13,669
the wide field camera 3 is one of those

2
00:00:16,070 --> 00:00:14,719
instruments

3
00:00:18,310 --> 00:00:16,080
that's going to make hubble you know 10

4
00:00:20,390 --> 00:00:18,320
times better in discovery space it's the

5
00:00:21,910 --> 00:00:20,400
highest science priority on the mission

6
00:00:25,990 --> 00:00:21,920
and we're very excited to be able to put

7
00:00:31,109 --> 00:00:28,950
we do have to take out an an existing

8
00:00:34,069 --> 00:00:31,119
instrument that it is still operational

9
00:00:36,389 --> 00:00:34,079
and that is the fabulous with pic2 i

10
00:00:38,310 --> 00:00:36,399
mean that has been the workhorse imager

11
00:00:41,110 --> 00:00:38,320
for hst

12
00:00:43,670 --> 00:00:41,120
for much of the hst lifetime from its

13
00:00:46,709 --> 00:00:43,680

installation in the 1993 first servicing

14
00:00:47,670 --> 00:00:46,719
mission it was the first camera that

15
00:00:50,069 --> 00:00:47,680
gave

16
00:00:52,709 --> 00:00:50,079
the kind of images that hst was intended

17
00:00:54,310 --> 00:00:52,719
to provide so many of the iconic images

18
00:00:55,670 --> 00:00:54,320
like the eagle nebula pillars of

19
00:01:03,349 --> 00:00:55,680
creation and so on those are with

20
00:01:07,109 --> 00:01:04,869
wide field three

21
00:01:09,429 --> 00:01:07,119
is probably two generations improved

22
00:01:11,350 --> 00:01:09,439
over with pick two

23
00:01:13,429 --> 00:01:11,360
wide field is what they call a facility

24
00:01:16,149 --> 00:01:13,439
class instrument what they did was

25
00:01:18,469 --> 00:01:16,159
assemble a team of scientists and they

26
00:01:20,789 --> 00:01:18,479
got together and said let's put together

27
00:01:22,710 --> 00:01:20,799
the best possible instrument that can

28
00:01:24,630 --> 00:01:22,720
give us the the widest possible

29
00:01:26,789 --> 00:01:24,640
scientific use

30
00:01:29,030 --> 00:01:26,799
the original design of whitefield the

31
00:01:31,990 --> 00:01:29,040
day one design of whitefield

32
00:01:35,109 --> 00:01:32,000
was very similar to riftbik 2

33
00:01:36,069 --> 00:01:35,119
in the sense that we had a single camera

34
00:01:39,749 --> 00:01:36,079
however

35
00:01:42,310 --> 00:01:39,759
it was decided to add a second camera

36
00:01:45,109 --> 00:01:42,320
inside the wi-fi camera three we want

37
00:01:48,149 --> 00:01:45,119
not just great uv visible performance we

38
00:01:50,630 --> 00:01:48,159

want great infrared performance and that

39
00:01:52,870 --> 00:01:50,640
that caused us to take the initial

40
00:01:55,429 --> 00:01:52,880
design which is essentially pretty full

41
00:01:57,590 --> 00:01:55,439
five pounds of sugar in a five pound bag

42
00:02:00,630 --> 00:01:57,600
it all fit quite neatly and now we have

43
00:02:03,109 --> 00:02:00,640
to add a second five pounds of sugar

44
00:02:05,030 --> 00:02:03,119
into this bag there is so much stuff

45
00:02:06,870 --> 00:02:05,040
inside wide field that all of our

46
00:02:08,630 --> 00:02:06,880
electronics boxes have to hang on the

47
00:02:11,430 --> 00:02:08,640
outside and it looks a little bit like

48
00:02:12,790 --> 00:02:11,440
fiber mcgee's closet with harnessing and

49
00:02:14,550 --> 00:02:12,800
all of these wires and cables and

50
00:02:16,710 --> 00:02:14,560
everything's connected all funky and

51
00:02:18,309 --> 00:02:16,720
it's just because they're trying to do

52
00:02:20,229 --> 00:02:18,319
so much with this facility class

53
00:02:21,430 --> 00:02:20,239
instrument it's the last

54
00:02:23,110 --> 00:02:21,440
imaging instrument that's going to be

55
00:02:27,910 --> 00:02:23,120
put on the telescope we want it to

56
00:02:33,589 --> 00:02:30,630
the most novel technology however was

57
00:02:36,229 --> 00:02:33,599
the infrared arrays

58
00:02:39,350 --> 00:02:36,239
the infrared is particularly good at

59
00:02:41,030 --> 00:02:39,360
looking at the very distant universe and

60
00:02:42,710 --> 00:02:41,040
when you look

61
00:02:44,630 --> 00:02:42,720
at things at a great distance in

62
00:02:48,150 --> 00:02:44,640
astronomy you're also looking far back

63
00:02:50,070 --> 00:02:48,160

in the past so closer to the beginning

64
00:02:52,550 --> 00:02:50,080
of the universe closer to the big bang

65
00:02:53,670 --> 00:02:52,560
earlier in the lifetimes of galaxies and

66
00:02:55,670 --> 00:02:53,680
so on

67
00:02:56,550 --> 00:02:55,680
because whitefield camera 3 has this

68
00:02:58,710 --> 00:02:56,560
wide

69
00:03:01,110 --> 00:02:58,720
panchromatic color coverage we can

70
00:03:03,670 --> 00:03:01,120
progress from ultraviolet to visible

71
00:03:06,309 --> 00:03:03,680
and then progress onward beyond that to

72
00:03:08,710 --> 00:03:06,319
the red and the near infrared and as we

73
00:03:11,270 --> 00:03:08,720
do that we're progressing from hot young

74
00:03:14,229 --> 00:03:11,280
stars to middle-aged stars to older

75
00:03:16,229 --> 00:03:14,239
stars within the same galaxy and all

76
00:03:18,470 --> 00:03:16,239
those different populations of stars

77
00:03:21,509 --> 00:03:18,480
exist within the same galaxy it's the

78
00:03:24,390 --> 00:03:21,519
family album the family photo album for

79
00:03:26,309 --> 00:03:24,400
that galaxy the other thing is to probe

80
00:03:28,229 --> 00:03:26,319
this very mysterious phenomenon that's

81
00:03:31,430 --> 00:03:28,239
called dark energy

82
00:03:33,830 --> 00:03:31,440
which is a the catch phrase for a

83
00:03:35,270 --> 00:03:33,840
force that is not understood in terms of

84
00:03:37,430 --> 00:03:35,280
the physics

85
00:03:43,589 --> 00:03:37,440
force that is accelerating the expansion

86
00:03:47,270 --> 00:03:45,350
what's been so amazing about each of

87
00:03:49,670 --> 00:03:47,280
these cameras over the history of the

88
00:03:52,070 --> 00:03:49,680

hubble program is what it finds is

89
00:03:54,070 --> 00:03:52,080
something we never knew we point it we

90
00:03:56,070 --> 00:03:54,080
learn a little bit and somebody goes

91
00:03:58,710 --> 00:03:56,080
huh i wonder

92
00:04:01,110 --> 00:03:58,720
and off they go and then the world has

93
00:04:02,470 --> 00:04:01,120
changed forever based on on something