1
00:00:05,590 --> 00:00:03,669
[Music]

2
00:00:07,349 --> 00:00:05,600
when it opens its eyes to our universe

3
00:00:10,310 --> 00:00:07,359
in the mid-2020s

4
00:00:13,190 --> 00:00:10,320
wfirst the wide field infrared survey

5
00:00:15,350 --> 00:00:13,200
telescope will capture images unlike any

6
00:00:16,870 --> 00:00:15,360
satellite before it

7
00:00:19,189 --> 00:00:16,880
wfirst will have the same image

8
00:00:22,150 --> 00:00:19,199
resolution as hubble but will cover an

9
00:00:24,150 --> 00:00:22,160
area 100 times larger

10
00:00:25,750 --> 00:00:24,160
wfirst will also view the sky in

11
00:00:27,990 --> 00:00:25,760
carefully selected wavelengths of

12
00:00:30,310 --> 00:00:28,000
infrared light which will allow it to

13
00:00:32,389 --> 00:00:30,320

see through obscuring dust to reveal

14
00:00:36,790 --> 00:00:32,399
hidden stars and watch the growth of

15
00:00:39,830 --> 00:00:38,549
to see what the sky will look like to

16
00:00:41,670 --> 00:00:39,840
wfirst

17
00:00:45,029 --> 00:00:41,680
scientists use special processing

18
00:00:47,350 --> 00:00:45,039
techniques to create simulated images

19
00:00:49,990 --> 00:00:47,360
in this case they began with a hubble

20
00:00:52,069 --> 00:00:50,000
mosaic of andromeda one of the closest

21
00:00:55,270 --> 00:00:52,079
galaxies to our own

22
00:00:58,229 --> 00:00:55,280
released in 2015 this mosaic was created

23
00:01:00,790 --> 00:00:58,239
out of over 400 individual hubble images

24
00:01:03,670 --> 00:01:00,800
and took more than three years

25
00:01:05,750 --> 00:01:03,680
because of its enormous coverage wfirst

26
00:01:08,550 --> 00:01:05,760
will be able to create a similar mosaic

27
00:01:10,390 --> 00:01:08,560
with just two images each taking about

28
00:01:12,950 --> 00:01:10,400
90 minutes

29
00:01:15,590 --> 00:01:12,960
wfirst images are actually made of 18

30
00:01:18,630 --> 00:01:15,600
separate panels each one corresponding

31
00:01:20,390 --> 00:01:18,640
to a single 16 megapixel detector

32
00:01:22,550 --> 00:01:20,400
the arrangement of these detectors

33
00:01:24,950 --> 00:01:22,560
creates the distinctive wfirst image

34
00:01:29,109 --> 00:01:27,109
the simulated image is not just special

35
00:01:30,950 --> 00:01:29,119
because of its size however

36
00:01:32,950 --> 00:01:30,960
it also shows andromeda as it will

37
00:01:35,030 --> 00:01:32,960
appear through wfirst optics and

38
00:01:36,550 --> 00:01:35,040

infrared filters

39
00:01:38,469 --> 00:01:36,560
to achieve this

40
00:01:40,789 --> 00:01:38,479
scientists started with hubble filters

41
00:01:43,190 --> 00:01:40,799
that are closest to wfirsts

42
00:01:44,950 --> 00:01:43,200
then they used software to measure the

43
00:01:47,109 --> 00:01:44,960
positions and brightnesses of the

44
00:01:49,670 --> 00:01:47,119
roughly 100 million stars in those

45
00:01:52,469 --> 00:01:49,680
images and applied those as input to

46
00:01:54,789 --> 00:01:52,479
wfirst image simulation software which

47
00:01:56,630 --> 00:01:54,799
added each star back to the image after

48
00:02:00,530 --> 00:01:56,640
applying the expected effects of the

49
00:02:01,670 --> 00:02:00,540
wfirst optics filters and detectors

50
00:02:03,910 --> 00:02:01,680
[Music]

51
00:02:05,670 --> 00:02:03,920
the resulting image reveals many stars

52
00:02:06,870 --> 00:02:05,680
that were blocked by dust in visible

53
00:02:11,190 --> 00:02:06,880
light

54
00:02:13,190 --> 00:02:11,200
a more comprehensive view of the stars

55
00:02:15,830 --> 00:02:13,200
in the local universe

56
00:02:17,589 --> 00:02:15,840
wfirst will also use its broad view to

57
00:02:18,949 --> 00:02:17,599
search for planets around other stars in

58
00:02:20,630 --> 00:02:18,959
our galaxy

59
00:02:22,790 --> 00:02:20,640
and to look for the fingerprint of dark

60
00:02:25,350 --> 00:02:22,800
matter and dark energy in the distant

61
00:02:27,350 --> 00:02:25,360
reaches of the universe

62
00:02:28,869 --> 00:02:27,360
with an unprecedented combination of

63
00:02:31,910 --> 00:02:28,879

breadth and depth