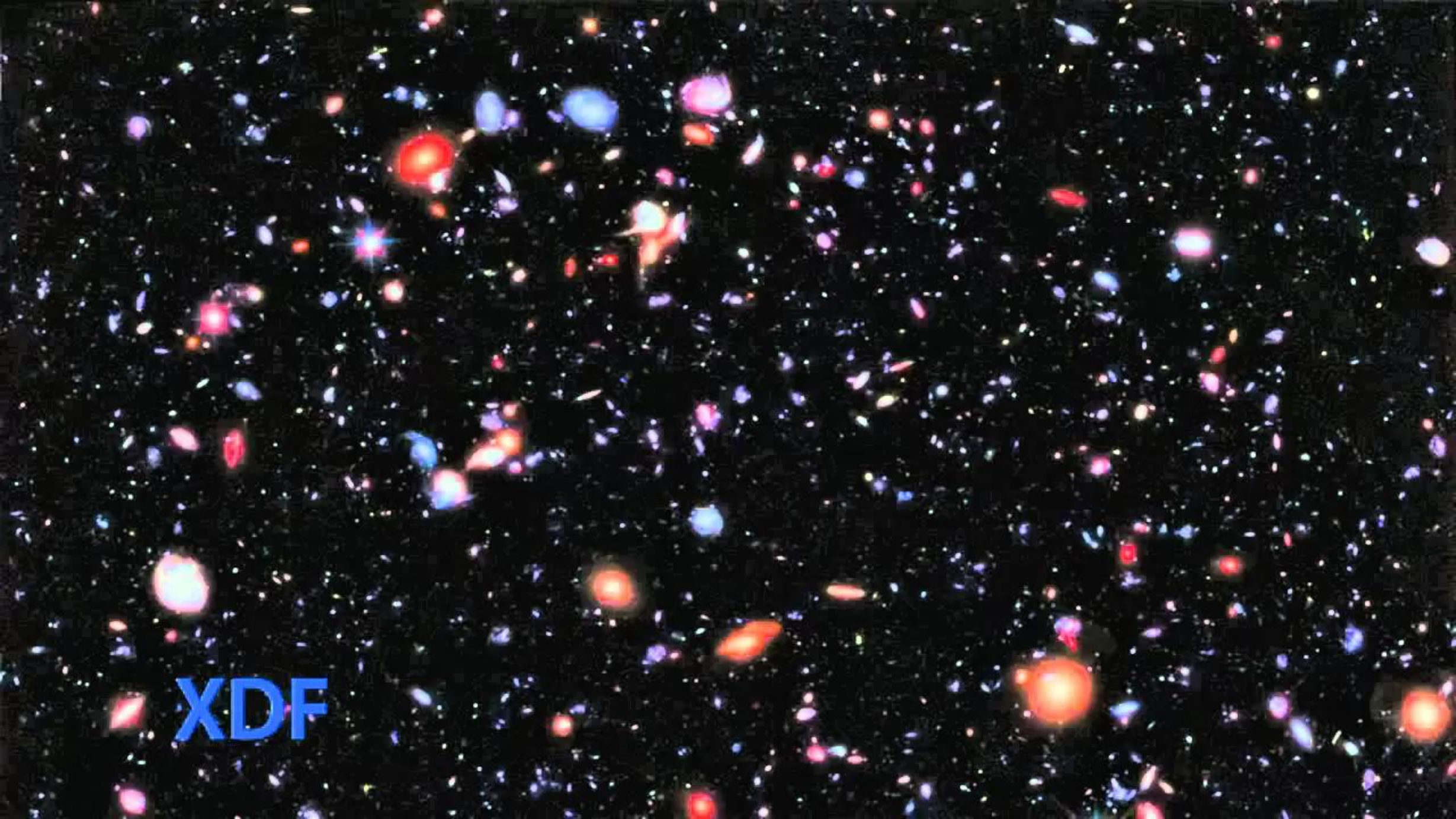
XDF

1
00:00:05,030 --> 00:00:02,570
looking deep into the universe is like

2
00:00:07,070 --> 00:00:05,040
taking a trip down memory lane the

3
00:00:08,930 --> 00:00:07,080
farther from Earth we look the farther

4
00:00:11,450 --> 00:00:08,940
back in time we see

5
00:00:14,150 --> 00:00:11,460
Starlight from the remote past is just

6
00:00:16,070 --> 00:00:14,160
arriving at Earth now telescopes are

7
00:00:18,410 --> 00:00:16,080
time machines for exploring what

8
00:00:21,170 --> 00:00:18,420
happened billions of years ago

9
00:00:23,990 --> 00:00:21,180
but before the Hubble Space Telescope we

10
00:00:26,029 --> 00:00:24,000
could only see so far we had a view that

11
00:00:27,769 --> 00:00:26,039
galaxies were out there a few billion

12
00:00:30,290 --> 00:00:27,779
years back but we didn't know if they

13
00:00:33,470 --> 00:00:30,300

went all the way back to the very

14
00:00:36,650 --> 00:00:33,480
earliest epics in the universe that all

15
00:00:39,110 --> 00:00:36,660
changed when Hubble got on the job in

16
00:00:41,569 --> 00:00:39,120
2003 astronomers used Hubble to look

17
00:00:44,450 --> 00:00:41,579
back in time to within a billion years

18
00:00:47,090 --> 00:00:44,460
after the big bang this was the first

19
00:00:49,250 --> 00:00:47,100
time we were able to explore an age of

20
00:00:50,810 --> 00:00:49,260
the universe we could only dream of

21
00:00:52,910 --> 00:00:50,820
before

22
00:00:56,510 --> 00:00:52,920
the image was called the ultra Deep

23
00:00:59,990 --> 00:00:56,520
Field and that changed everything we saw

24
00:01:02,750 --> 00:01:00,000
things that were much farther away than

25
00:01:04,490 --> 00:01:02,760
any previous observations had shown us

26
00:01:06,289 --> 00:01:04,500
and also when you're looking back when

27
00:01:09,590 --> 00:01:06,299
the universe was less than a million

28
00:01:13,370 --> 00:01:09,600
years old and be able to find objects

29
00:01:15,350 --> 00:01:13,380
that existed at that time liftoff of

30
00:01:17,890 --> 00:01:15,360
space shuttle Appliance when the Hubble

31
00:01:20,390 --> 00:01:17,900
was serviced for the last time in 2008

32
00:01:23,210 --> 00:01:20,400
scientists saw a way to expand our

33
00:01:26,330 --> 00:01:23,220
vision of the universe even further by

34
00:01:29,390 --> 00:01:26,340
using the new infrared camera

35
00:01:31,490 --> 00:01:29,400
we could push out to earlier times we

36
00:01:33,890 --> 00:01:31,500
could find even more distant objects and

37
00:01:36,590 --> 00:01:33,900
we'd ever been able to do before that

38
00:01:38,870 --> 00:01:36,600

new research take the area around

39
00:01:41,270 --> 00:01:38,880
these objects combined with the ultra

40
00:01:44,330 --> 00:01:41,280
deep Fields use of visible light pulled

41
00:01:47,090 --> 00:01:44,340
out and displayed here is now called the

42
00:01:49,310 --> 00:01:47,100
extreme deep field we can't see the

43
00:01:52,310 --> 00:01:49,320
first galaxies but this has put us on

44
00:01:53,170 --> 00:01:52,320
the fringes of that time and so we've

45
00:01:57,109 --> 00:01:53,180
been

46
00:02:00,170 --> 00:01:57,119
sort of focusing in now on when the

47
00:02:03,170 --> 00:02:00,180
first galaxies formed as revealing as

48
00:02:06,350 --> 00:02:03,180
the extreme deep field is

49
00:02:08,510 --> 00:02:06,360
it's only a preview of what lies ahead

50
00:02:10,190 --> 00:02:08,520
we need to take a giant leap forward and

51
00:02:12,290 --> 00:02:10,200
that's what James Webb's face telescope

52
00:02:15,050 --> 00:02:12,300
will do you know it's a hundred times

53
00:02:17,330 --> 00:02:15,060
what Hubble can do so when that flies

54
00:02:19,190 --> 00:02:17,340
you know in minutes it can hours it can

55
00:02:21,410 --> 00:02:19,200
do what we've done on Hubble that have

56
00:02:23,270 --> 00:02:21,420
taken weeks months

57
00:02:25,190 --> 00:02:23,280
it's incredible

58
00:02:27,470 --> 00:02:25,200
what's also incredible is the

59
00:02:31,190 --> 00:02:27,480
realization that this small slice of the

60
00:02:34,009 --> 00:02:31,200
universe is just that a slice multiply

61
00:02:37,430 --> 00:02:34,019
this by 30 million and you get an idea

62
00:02:39,170 --> 00:02:37,440
of just how many galaxies are out there

63
00:02:41,630 --> 00:02:39,180

from the Space Telescope Science