1
00:00:09,040 --> 00:00:10,380
(Music)
Hubble is turning 25…

2
00:00:10,380 --> 00:00:13,110
It's hard to believe!

3
00:00:13,110 --> 00:00:16,900
IT'S BEEN A FEW DECADES SINCE NANCY ROMAN
WORKED ON THE HUBBLE SPACE TELESCOPE, BUT

4
00:00:16,900 --> 00:00:22,939
SHE STILL HAS VIVID MEMORIES OF A TIME WHEN
THE OBSERVATORY WAS STILL ON THE DRAWING BOARD.

5
00:00:22,939 --> 00:00:28,450
ROMAN: I remember when we were thinking about,
hoping it would last 15 years.

6
00:00:28,450 --> 00:00:34,590
I'm certainly glad it's lasted another 10…
and still going strong.

7
00:00:34,590 --> 00:00:38,100
NOT BAD FOR A TELESCOPE THAT ALMOST DIDN'T
GET BUILT.

8
00:00:38,100 --> 00:00:46,460
O'DELL: Some of the most influential astronomers
thought it was better to spend 300-million

9
00:00:46,460 --> 00:00:55,300
dollars by building 20 duplicates of the Palomar
200-inch telescope rather than spending the

10
00:00:55,300 --> 00:01:00,930
money on, the same amount of money on one
very expensive telescope in space.

11

00:01:00,930 --> 00:01:06,570
WHILE THERE WERE PEOPLE LOBBYING AGAINST THE
TELESCOPE, OTHERS COULDN'T WAIT TO USE A LARGE

12
00:01:06,570 --> 00:01:08,350
ORBITING OBSERVATORY.

13
00:01:08,350 --> 00:01:15,890
ROMAN: Astronomers have wanted for generations
actually to get a telescope above the atmosphere.

14
00:01:15,890 --> 00:01:21,860
I like to describe the atmosphere as being
something like looking through an old stained

15
00:01:21,860 --> 00:01:23,430
glass window.

16
00:01:23,430 --> 00:01:30,010
The window has dust on it so the background
is kind of scattered and bright.

17
00:01:30,010 --> 00:01:32,950
Stained glass is colored.

18
00:01:32,950 --> 00:01:36,550
So that you only see certain colors through
it.

19
00:01:36,550 --> 00:01:40,850
You only see certain colors through the atmosphere
and we were anxious to see some of the other

20
00:01:40,850 --> 00:01:42,110
colors from the universe.

21
00:01:42,110 --> 00:01:49,490
O'DELL: The very sharp images it would produce
would allow you to see things that were much

22
00:01:49,490 --> 00:01:55,189
fainter than would ever be possible from the
ground.

23
00:01:55,189 --> 00:02:00,909
EVENTUALLY, THE MISSION KNOWN AS THE LARGE
SPACE TELESCOPE BEGAN IN EARNEST DURING THE

24
00:02:00,909 --> 00:02:02,170
1970'S.

25
00:02:02,170 --> 00:02:05,780
BUT HOW WOULD AN OBSERVATORY OUT IN SPACE
BE OPERATED?

26
00:02:05,780 --> 00:02:11,039
ROMAN: Man would ride along with the telescope
and look through it.

27
00:02:11,039 --> 00:02:15,129
In the first place, we wanted to get rid of
the atmosphere and the man needed the atmosphere.

28
00:02:15,129 --> 00:02:17,680
Secondly, a man would wiggle.

29
00:02:17,680 --> 00:02:21,280
And I don't care how, how much he tried to
stay, stay, stay still.

30
00:02:21,280 --> 00:02:26,450
No man or woman is going to sit for an hour
without moving!

31
00:02:26,450 --> 00:02:29,170
ENGINEERS WOULD HAVE TO LOOK AT OTHER OPTIONS.

32
00:02:29,170 --> 00:02:36,829
O'DELL: The detectors were photographic film,

photographic plates, no where as sensitive

33
00:02:36,829 --> 00:02:38,829
as we have today.

34
00:02:38,829 --> 00:02:45,360
ROMAN: The DoD did use photographic film for
reconnaissance, would drop the film into the

35
00:02:45,360 --> 00:02:47,659
ocean where it could be picked up.

36
00:02:47,659 --> 00:02:52,060
But that was much too expensive a process
for NASA.

37
00:02:52,060 --> 00:03:00,800
INSTEAD, NASA LOOKED AT STORING THE IMAGES
DIGITALLY ON CHARGE COUPLED DEVICES OR CCDs.

38
00:03:00,800 --> 00:03:04,590
PROBLEM WAS, CCD TECHNOLOGY WAS IN ITS INFANCY.

39
00:03:04,590 --> 00:03:10,010
ROMAN: They were becoming of interest to the
television industry.

40
00:03:10,010 --> 00:03:16,870
The problem was that CCDs had no sensitivity
in the ultraviolet.

41
00:03:16,870 --> 00:03:21,499
And one of the things we wanted to do with
the Hubble was to work in the ultraviolet.

42
00:03:21,499 --> 00:03:27,549
Coating the detectors with a chlorinate, an
organic compound would make them sensitive

43

00:03:27,549 --> 00:03:29,510
to the ultraviolet.

44
00:03:29,510 --> 00:03:35,640
So the first use of the CCDs in astronomy
was actually the proof of concept for Hubble.

45
00:03:35,640 --> 00:03:41,109
WHAT WAS ARGUABLY THE BIGGEST OBSTACLE STANDING
IN THE WAY OF HUBBLE GETTING THE MONEY TO

46
00:03:41,109 --> 00:03:42,780
PAY FOR IT.

47
00:03:42,780 --> 00:03:45,169
HUBBLE SUPPORTERS WON OUT IN THE END.

48
00:03:45,169 --> 00:03:51,279
ROMAN: I did a back of the envelope calculation
and my answer was for the cost of a night

49
00:03:51,279 --> 00:03:59,530
at the movies every American taxpayer would
have 15 years of exciting discoveries.

50
00:03:59,530 --> 00:04:04,290
ADD ANOTHER 10 YEARS FOR GOOD MEASURE AND
HUBBLE HAS NOT ONLY ECLIPSED EXPECTATIONS,

51
00:04:04,290 --> 00:04:07,499
BUT EVEN MORE DISCOVERIES ARE PROBABLY ON
THE HORIZON.