

1  
00:00:09,039 --> 00:00:10,379  
(Music)  
Hubble is turning 25...

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

3  
00:00:13,109 --> 00:00:16,899  
IT'S BEEN A FEW DECADES SINCE NANCY ROMAN  
WORKED ON THE HUBBLE SPACE TELESCOPE, BUT

4  
00:00:16,899 --> 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 --> 00:00:28,449  
ROMAN: I remember when we were thinking about,  
hoping it would last 15 years.

6  
00:00:28,449 --> 00:00:34,589  
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 --> 00:00:55,299  
dollars by building 20 duplicates of the Palomar  
200-inch telescope rather than spending the

10  
00:00:55,299 --> 00:01:00,929  
money on, the same amount of money on one  
very expensive telescope in space.

11  
00:01:00,929 --> 00:01:06,569  
WHILE THERE WERE PEOPLE LOBBYING AGAINST THE  
TELESCOPE, OTHERS COULDN'T WAIT TO USE A LARGE

12  
00:01:06,569 --> 00:01:08,349

## ORBITING OBSERVATORY.

13

00:01:08,349 --> 00:01:15,890

ROMAN: Astronomers have wanted for generations actually to get a telescope above the atmosphere.

14

00:01:15,890 --> 00:01:21,859

I like to describe the atmosphere as being something like looking through an old stained

15

00:01:21,859 --> 00:01:23,429

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 --> 00:01:36,549

So that you only see certain colors through it.

19

00:01:36,549 --> 00:01:40,849

You only see certain colors through the atmosphere and we were anxious to see some of the other

20

00:01:40,849 --> 00:01:42,109

colors from the universe.

21

00:01:42,109 --> 00:01:49,489

O'DELL: The very sharp images it would produce would allow you to see things that were much

22

00:01:49,489 --> 00:01:55,188

fainter than would ever be possible from the ground.

23

00:01:55,188 --> 00:02:00,908

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 --> 00:02:11,038  
ROMAN: Man would ride along with the telescope  
and look through it.

27  
00:02:11,038 --> 00:02:15,128  
In the first place, we wanted to get rid of  
the atmosphere and the man needed the atmosphere.

28  
00:02:15,128 --> 00:02:17,679  
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 --> 00:02:26,449  
No man or woman is going to sit for an hour  
without moving!

31  
00:02:26,449 --> 00:02:29,169  
ENGINEERS WOULD HAVE TO LOOK AT OTHER OPTIONS.

32  
00:02:29,169 --> 00:02:36,828  
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  
00:02:47,658 --> 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 --> 00:03:10,009  
ROMAN: They were becoming of interest to the  
television industry.

40  
00:03:10,009 --> 00:03:16,870  
The problem was that CCDs had no sensitivity  
in the ultraviolet.

41  
00:03:16,870 --> 00:03:21,498  
And one of the things we wanted to do with  
the Hubble was to work in the ultraviolet.

42  
00:03:21,498 --> 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  
00:03:29,509 --> 00:03:35,639  
So the first use of the CCDs in astronomy  
was actually the proof of concept for Hubble.

45  
00:03:35,639 --> 00:03:41,108  
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

00:03:51,278 --> 00:03:59,530  
at the movies every American taxpayer would  
have 15 years of exciting discoveries.

50  
00:03:59,530 --> 00:04:04,289  
ADD ANOTHER 10 YEARS FOR GOOD MEASURE AND  
HUBBLE HAS NOT ONLY ECLIPSED EXPECTATIONS,

51  
00:04:04,289 --> 00:04:07,498  
BUT EVEN MORE DISCOVERIES ARE PROBABLY ON  
THE HORIZON.

52  
00:04:07,498 --> 00:04:15,739  
FROM THE SPACE TELESCOPE SCIENCE INSTITUTE  
IN BALTIMORE, MD, I'M MARY ESTACION.