

1  
00:00:13,099 --> 00:00:18,019  
As each piece of the James Webb Space Telescope is built, it has to be tested rigorously.

2  
00:00:18,019 --> 00:00:21,500  
But the telescope, at some point, needs to be tested as a whole.

3  
00:00:21,500 --> 00:00:26,070  
Webb, though, is enormous, standing several stories tall.

4  
00:00:26,070 --> 00:00:31,618  
To make sure the observatory will work in deep space, NASA has to use its biggest thermal

5  
00:00:31,618 --> 00:00:35,590  
vacuum chamber it has, the one here at the Johnson Space Center in Houston, Texas.

6  
00:00:35,590 --> 00:00:36,660  
Mary Estacion/Reporter: Hi Mary [Cerimele]!

7  
00:00:36,659 --> 00:00:38,389  
Mary Cerimele/Deputy Project Manager, JWST Chamber Test: Hi!

8  
00:00:38,390 --> 00:00:43,020  
Estacion: I understand that you can tell us more about what you guys are doing with this

9  
00:00:43,020 --> 00:00:44,020  
chamber.

10  
00:00:44,020 --> 00:00:48,790  
Cerimele: We embarked on a rather large construction project to get our thermal vacuum chamber

11  
00:00:48,789 --> 00:00:51,329  
ready for James Webb Space Telescope.

12  
00:00:51,329 --> 00:00:54,969  
This chamber has a lot of history, stemming back from Apollo times.

13  
00:00:54,969 --> 00:01:00,460  
The chamber itself was actually built in the  
1960's to get ready for the space race.

14  
00:01:00,460 --> 00:01:04,890  
Mary: We see a nice wide angle of this, can  
we get a closer view of what's really going

15  
00:01:04,890 --> 00:01:05,890  
in here?

16  
00:01:05,890 --> 00:01:07,489  
Cerimele: We can go inside and take a closer  
look.

17  
00:01:07,489 --> 00:01:09,619  
Estacion: Mary, why are you taking us out  
here?

18  
00:01:09,620 --> 00:01:15,359  
Cerimele: Well, these are the original liquid  
nitrogen tanks that we used for the testing

19  
00:01:15,359 --> 00:01:21,319  
of Apollo and it contains all the liquid nitrogen  
we need to make the chamber below 300 degrees

20  
00:01:21,319 --> 00:01:22,319  
Fahrenheit.

21  
00:01:22,319 --> 00:01:23,319  
Estacion: What are we going to see next?

22  
00:01:23,319 --> 00:01:26,408  
Cerimele: We're going to look at some of the  
things we've had to remove from the Apollo

23  
00:01:26,409 --> 00:01:30,130  
testing to get ready for James Webb and go  
up to the fifth level.

24  
00:01:30,129 --> 00:01:34,099  
Cerimele: Solar lamps were part of testing  
for the Apollo.

25  
00:01:34,099 --> 00:01:39,839  
The vehicle needed to have a high intensity  
heat source on one side at a time.

26  
00:01:39,840 --> 00:01:44,930  
Some of them will be closed off and some of  
them will be used to pass in new piping for

27  
00:01:44,930 --> 00:01:45,930  
helium.

28  
00:01:45,930 --> 00:01:46,930  
Estacion: The helium is for what?

29  
00:01:46,930 --> 00:01:52,640  
Cerimele: The helium will supply, basically  
a big soup can inside the can of the chamber

30  
00:01:52,640 --> 00:01:54,579  
which is going to make the chamber cold.

31  
00:01:54,578 --> 00:01:58,578  
Estacion: Colder than the 300 degrees below  
zero that Apollo had to face?

32  
00:01:58,578 --> 00:02:02,259  
Cerimele: Colder than the nitrogen temperatures  
we have for Apollo.

33  
00:02:02,260 --> 00:02:07,340  
It'll go below 400 degrees for the James Webb  
Space Telescope.

34  
00:02:07,340 --> 00:02:11,890  
Cerimele: Here we are at the fifth level entrance  
to the chamber and I'll let our lead for test

35  
00:02:11,889 --> 00:02:15,239  
operations tell you what we have to do for  
the vehicle inside the chamber.

36  
00:02:15,240 --> 00:02:18,800  
Pat O'Rear/Lead, Test Operations: As you can  
see there's some work going on.

37  
00:02:18,800 --> 00:02:21,210  
The scaffolding has just been erected.

38  
00:02:21,210 --> 00:02:24,140  
We're about to get ready to install the helium shroud.

39  
00:02:24,139 --> 00:02:28,299  
O'Rear: We have to mask off anything when we're done that could be a crack or what we

40  
00:02:28,300 --> 00:02:32,000  
call a stray light path into the interior of the chamber.

41  
00:02:32,000 --> 00:02:37,599  
Any heat sources, any light sources, those would all affect the proper operation of the

42  
00:02:37,599 --> 00:02:38,599  
telescope.

43  
00:02:38,599 --> 00:02:40,090  
Estacion: We're down on the ground level.

44  
00:02:40,090 --> 00:02:41,090  
O'Rear: This is it!

45  
00:02:41,090 --> 00:02:43,950  
This is the floor of the chamber.

46  
00:02:43,949 --> 00:02:49,339  
What you're actually standing on now used to be an old Apollo lunar turntable.

47  
00:02:49,340 --> 00:02:53,170  
This part of the floor used to rotate and that's one of the things that's been changed

48  
00:02:53,169 --> 00:02:54,609  
for James Webb.

49  
00:02:54,610 --> 00:02:59,220  
The mechanism that turned the floor had an

oil-based seal.

50

00:02:59,219 --> 00:03:04,300

Contamination is a risk for us, so that's  
been replaced and welded.

51

00:03:04,300 --> 00:03:05,400

Floor doesn't turn anymore.

52

00:03:05,400 --> 00:03:11,719

Estacion: So now you can see how NASA's past  
is paving the way for NASA's future.

53

00:03:11,719 --> 00:03:14,750

Thanks for joining us for this edition of  
Behind the Webb.