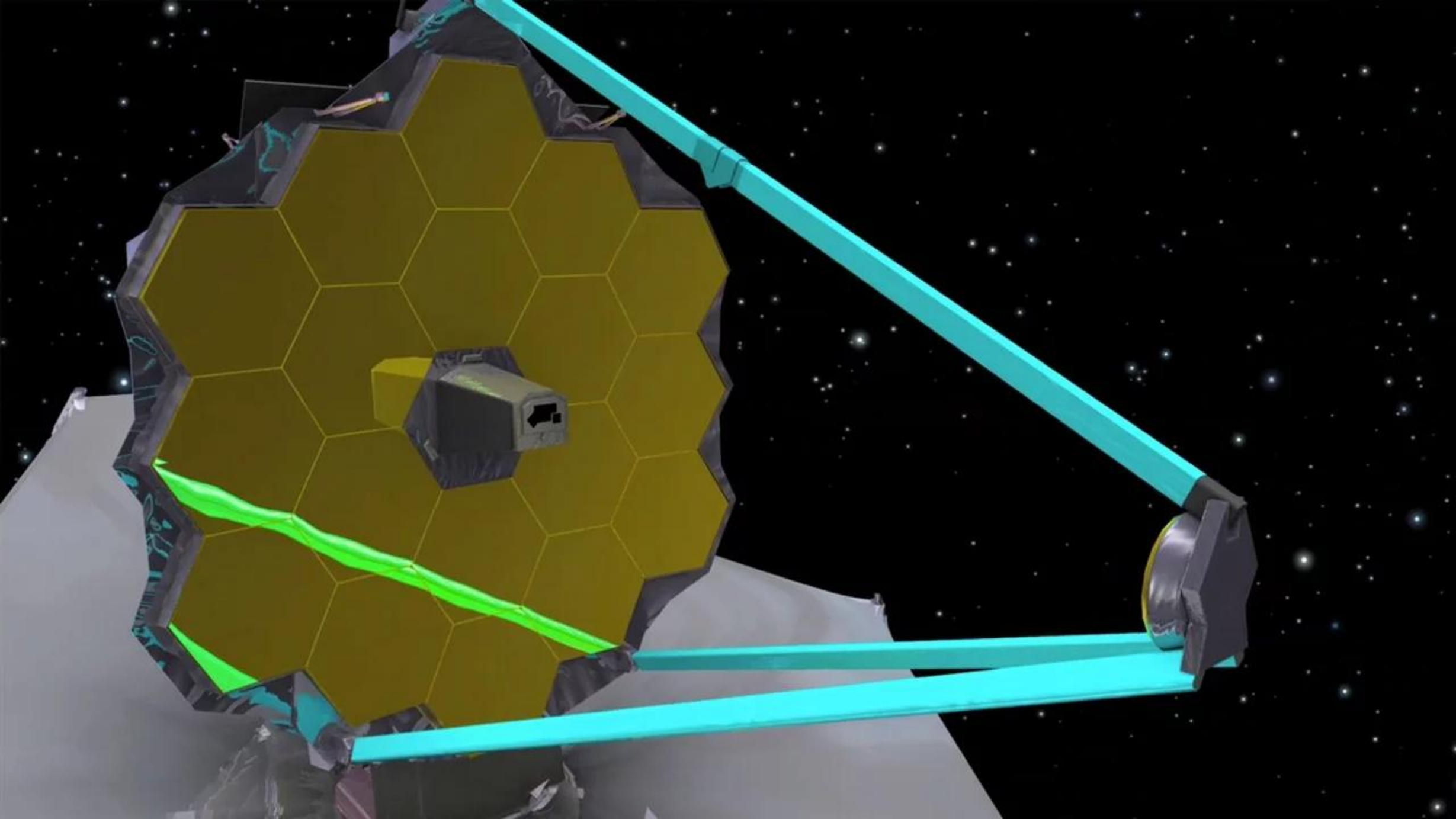

1
00:00:00,000 --> 00:00:12,320
[music]

2
00:00:13,100 --> 00:00:16,300
>> Mary Estacion/Reporter: Because the Webb Telescope is too large to fit into a rocket,

3
00:00:16,440 --> 00:00:22,100
engineers have designed it to unfold in a kind of a origami-like fashion when it gets into orbit.

4
00:00:22,200 --> 00:00:25,200
That goes for the mirrors on the observatory, too.

5
00:00:25,380 --> 00:00:28,200
The primary mirror that collects light from the cosmos?

6
00:00:28,320 --> 00:00:31,200
Well that light then bounces up to the secondary mirror

7
00:00:31,300 --> 00:00:33,700
before making its way to other mirrors

8
00:00:33,800 --> 00:00:36,700
and eventually ending up into the cameras.

9
00:00:36,840 --> 00:00:40,100
We’re here at NASA’s Goddard Space Flight Center in Greenbelt, Maryland,

10
00:00:40,240 --> 00:00:43,700
because the deployment of the secondary mirror is about to happen.

11
00:00:43,840 --> 00:00:47,700
So Adam, how do you guys get the secondary mirror into position?

12
00:00:47,820 --> 00:00:52,800
>> Adam Carpenter/Mechanical Integration Engineer, Sierra Lobo Inc.: Well, we deploy three struts that are mu

13
00:00:52,960 --> 00:00:57,300

and the secondary mirror will sit atop above the backplane.

14
00:00:57,460 --> 00:00:59,600
>> Mary: How important is this test?

15
00:00:59,780 --> 00:01:04,800
>> Adam: Well, this is the first time that we are deploying the tripod with a secondary mirror installed.

16
00:01:04,980 --> 00:01:08,900
As with anything on this project, every test builds upon another.

17
00:01:09,060 --> 00:01:12,500
So we want to be able to master this test

18
00:01:12,640 --> 00:01:16,700
and be able to perform it again when we get to the flight hardware.

19
00:01:16,860 --> 00:01:19,900
>> Mary: Well, can we take a closer look at what's going on down there?

20
00:01:20,000 --> 00:01:23,400
>>Adam: Absolutely, let's head into the cleanroom.

21
00:01:23,560 --> 00:01:28,800
You'll see the tripod come into place, just as I was saying upstairs.

22
00:01:28,980 --> 00:01:32,600
Now, two of the struts are the same but one is actually different

23
00:01:32,700 --> 00:01:36,900
in the sense that it has a hinge and it folds underneath when it's stowed.

24
00:01:37,060 --> 00:01:43,500
The entire observatory must be folded up so it fits into an Ariane 5.

25
00:01:43,680 --> 00:01:45,800
>> Mary: So, the way you're doing this test right now,

26
00:01:45,920 --> 00:01:48,900
this is not exactly the way it's going to be in space, right?

27
00:01:49,000 --> 00:01:51,100
>> Adam: Yes, absolutely.

28
00:01:51,240 --> 00:01:55,300
This yellow tower effectively creates a zero-G environment

29
00:01:55,440 --> 00:02:02,400
in the sense that it doesn’t allow the mid-hinge to close on its own when gravity takes over.

30
00:02:02,560 --> 00:02:07,200
We want to be able to control every aspect of the operation and that closing of the hinge.

31
00:02:07,340 --> 00:02:10,400
Well Mary, before the deployment is complete,

32
00:02:10,500 --> 00:02:12,600
how about we go upstairs to get a different perspective,

33
00:02:12,760 --> 00:02:14,800
but first we have to put these blue masks on

34
00:02:14,900 --> 00:02:17,700
because we’re going to be in such close proximity to the mirrors.

35
00:02:17,860 --> 00:02:20,600
>> Mary: Ok… how big are these struts anyway?

36
00:02:20,700 --> 00:02:28,600
>> Adam: The distance between the center of the backplane and the secondary mirror is about 25 feet.

37
00:02:28,760 --> 00:02:30,800
>> Mary: So it’s like a 2-story house or something.

38
00:02:30,900 --> 00:02:32,700

>> Adam: That's probably a very good comparison.

39
00:02:32,840 --> 00:02:34,900
>> Mary: How strong are these struts?

40
00:02:35,000 --> 00:02:41,400
>> Adam: These struts are very strong to withstand the stresses of very, very cold temperatures of space.

41
00:02:41,580 --> 00:02:47,900
They are hollow composite tubes, and the material is about 40,000ths of an inch think.

42
00:02:48,000 --> 00:02:49,100
>> Mary: So it's not very heavy.

43
00:02:49,200 --> 00:02:52,700
>> Adam: No. They're extremely light, but they're also very strong.

44
00:02:52,800 --> 00:02:56,920
>> Mary: So how precise do you have to be with the positioning of that secondary mirror?

45
00:02:57,080 --> 00:03:03,140
>> Adam: Each time we deploy the secondary mirror into the same position that it'll be in space,

46
00:03:03,440 --> 00:03:06,840
it is within one millimeter every time.

47
00:03:07,040 --> 00:03:11,100
>> Mary: Well, thanks Adam for helping us understand more about how the secondary mirror will be deployed.

48
00:03:11,260 --> 00:03:13,000
>> Adam: Thank you! It was my pleasure.

49
00:03:13,060 --> 00:03:17,660
>> Mary: The deployment of the secondary mirror happens on the 11th day after launch

50
00:03:17,760 --> 00:03:23,100
and is one of the last steps the Webb Telescope goes through before it's considered fully deployed.