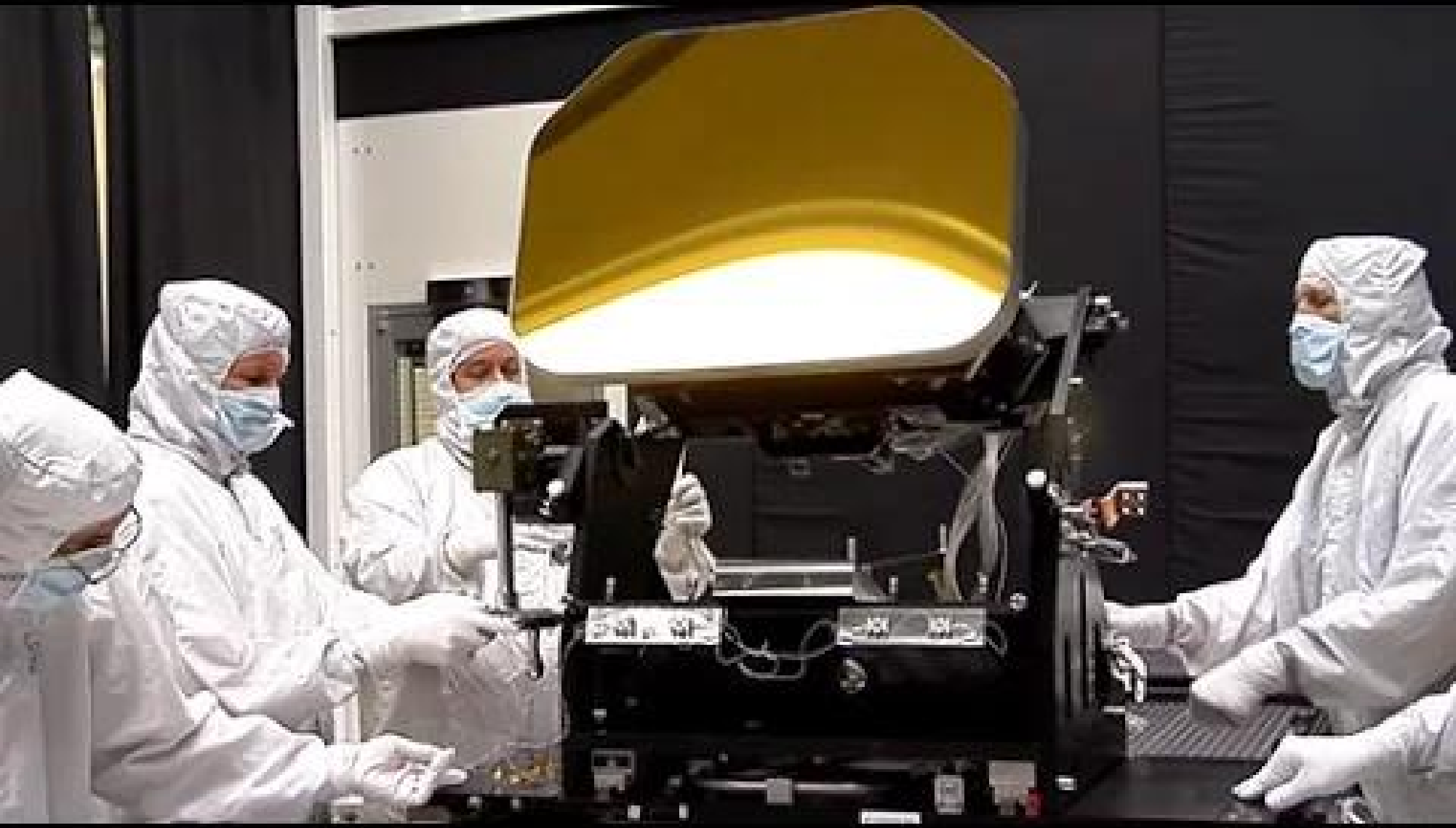

1
00:00:14,540 --> 00:00:17,590
Mary Estacion/Reporter: The primary mirror
segments on the James Webb Space Telescope

2
00:00:17,590 --> 00:00:21,860
get the most press because, if nothing else,
their sheer size.

3
00:00:21,860 --> 00:00:26,380
But there are other mirrors just as critical
to making the telescope work.

4
00:00:26,380 --> 00:00:29,790
To find out about something called the tertiary
mirror, we're here at Ball Aerospace to Koby

5
00:00:29,790 --> 00:00:32,930
Smith here at Ball Aerospace in Boulder, Colorado.

6
00:00:32,930 --> 00:00:35,340
Thanks for having us over....

7
00:00:35,340 --> 00:00:38,180
So Koby, tell us what's a tertiary mirror.

8
00:00:38,180 --> 00:00:40,500
How does it kind of figure into the whole
telescope operation?

9
00:00:40,500 --> 00:00:41,500
Koby Smith/AOS Lead, Ball Aerospace: Sure.

10
00:00:41,500 --> 00:00:46,020
You have the entire James Webb Space Telescope
as comprised of a primary mirror, which is,

11
00:00:46,020 --> 00:00:49,110
of course, built up of the 18 primary mirror
segments which is shown here.

12
00:00:49,110 --> 00:00:53,240
So you imagine your whole primary mirror as
18 of these segments all the way around in

13
00:00:53,240 --> 00:00:54,240
space.

14
00:00:54,240 --> 00:00:57,350
This Aft Optics Subsystem sits in the middle
of all of those mirrors.

15
00:00:57,350 --> 00:00:58,350
Alright.

16
00:00:58,350 --> 00:01:03,290
The light from, say, the galaxy or star you're
interested in, reflects off the primary mirror,

17
00:01:03,290 --> 00:01:08,290
off the secondary mirror, then into the aperture
here of the Aft Optics Subsystem, then reflects

18
00:01:08,290 --> 00:01:11,570
off the tertiary mirror, then again off the
fine steering mirror, and back into the science

19
00:01:11,570 --> 00:01:13,090
instruments in the back of the telescope.

20
00:01:13,090 --> 00:01:16,440
Mary: So the tertiary mirror is your third
stop in this optical path.

21
00:01:16,440 --> 00:01:17,440
Koby: Exactly.

22
00:01:17,440 --> 00:01:19,450
Mary: So do you have a tertiary mirror here?

23
00:01:19,450 --> 00:01:21,740
Koby: Actually we just received one from coating.

24
00:01:21,740 --> 00:01:23,000
We can go down on the floor.

25
00:01:23,000 --> 00:01:24,860
We'll unpack it and take it into optical test.

26
00:01:24,860 --> 00:01:30,420
Koby: So this afternoon, we're going to unpack
the coated, final polished tertiary mirror

27
00:01:30,420 --> 00:01:34,580
from the shipping container using the flight
transport cart on the soft jaws.

28
00:01:34,580 --> 00:01:39,420
Place it on the optical test stand here and
wheel that into the tent for the optical test

29
00:01:39,420 --> 00:01:41,299
table.

30
00:01:41,299 --> 00:01:43,960
Mary: Where are we now?

31
00:01:43,960 --> 00:01:48,390
Koby: We're in the optical test tent for both
the secondary mirror and the tertiary mirror.

32
00:01:48,390 --> 00:01:52,820
It's used and reconfigured for testing both
those optics.

33
00:01:52,820 --> 00:01:58,850
Over here is what's called an interferometer
and that's used to measure the surface quality

34
00:01:58,850 --> 00:02:00,650
of these optics.

35
00:02:00,650 --> 00:02:04,810
It sends out a wavefront of light and compares
it to a known reference.

36
00:02:04,810 --> 00:02:09,910
And any deviations on that surface will appear
as fringes on our camera screen.

37
00:02:09,910 --> 00:02:14,610
Mary: Thanks Kobe for giving us a sense of
the tertiary mirror does and the kind of testing

38
00:02:14,610 --> 00:02:15,610
it's going through.

39
00:02:15,610 --> 00:02:17,470
Koby: Thank you.

40
00:02:17,470 --> 00:02:22,459
Mary: So after this tertiary mirror goes through
this optical testing, it'll go through some

41
00:02:22,459 --> 00:02:27,879
vibration and thermal testing before being
integrated with the rest of the telescope.