

1
00:00:14,539 --> 00:00:17,589
Mary Estacion/Reporter: The primary mirror segments on the James Webb Space Telescope

2
00:00:17,589 --> 00:00:21,859
get the most press because, if nothing else, their sheer size.

3
00:00:21,859 --> 00:00:26,379
But there are other mirrors just as critical to making the telescope work.

4
00:00:26,379 --> 00:00:29,789
To find out about something called the tertiary mirror, we're here at Ball Aerospace to Koby

5
00:00:29,789 --> 00:00:32,929
Smith here at Ball Aerospace in Boulder, Colorado.

6
00:00:32,929 --> 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
00:00:38,179 --> 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 --> 00:00:46,019
You have the entire James Webb Space Telescope as comprised of a primary mirror, which is,

11
00:00:46,020 --> 00:00:49,109
of course, built up of the 18 primary mirror segments which is shown here.

12
00:00:49,109 --> 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 --> 00:01:03,289
The light from, say, the galaxy or star you're
interested in, reflects off the primary mirror,

17
00:01:03,289 --> 00:01:08,289
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
00:01:11,569 --> 00:01:13,089
instruments in the back of the telescope.

20
00:01:13,090 --> 00:01:16,439
Mary: So the tertiary mirror is your third
stop in this optical path.

21
00:01:16,439 --> 00:01:17,439
Koby: Exactly.

22
00:01:17,439 --> 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
00:01:21,739 --> 00:01:23,000
We can go down on the floor.

25
00:01:23,000 --> 00:01:24,859
We'll unpack it and take it into optical test.

26
00:01:24,859 --> 00:01:30,420
Koby: So this afternoon, we're going to unpack the coated, final polished tertiary mirror

27
00:01:30,420 --> 00:01:34,579
from the shipping container using the flight transport cart on the soft jaws.

28
00:01:34,579 --> 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
00:01:43,959 --> 00:01:48,389
Koby: We're in the optical test tent for both the secondary mirror and the tertiary mirror.

32
00:01:48,390 --> 00:01:52,819
It's used and reconfigured for testing both those optics.

33
00:01:52,819 --> 00:01:58,849
Over here is what's called an interferometer and that's used to measure the surface quality

34
00:01:58,849 --> 00:02:00,649
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 --> 00:02:09,909
And any deviations on that surface will appear as fringes on our camera screen.

37
00:02:09,909 --> 00:02:14,609
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

00:02:17,469 --> 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 --> 00:02:27,878

vibration and thermal testing before being integrated with the rest of the telescope.

42

00:02:27,878 --> 00:02:30,789

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