

Behind the Webb: Give Me Five (Episode 31) transcript

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Because the James Webb Space Telescope will be searching for the heat coming from faraway objects in the universe, the observatory needs to be kept cold. The layers of its sunshield will separate from each other – much like this fan does – in order to the Webb telescope from heating up. To find out more about how all of this is going to work, we've come to Northrop Grumman in Redondo Beach, California.

So Jud, I see that a test is about to happen here. What's going on?

Jud Yamane (Sunshield Chief Engineer/NGAS): Yes, We're about to deploy the second half of the membrane assembly to see how the whole system works together.... We're trying to verify the behaviors of the sunshield pan out like we expect them to. If there are problems with the deployment, then we can fix the problems before we get into our flight production.

How representative is it of the flight sunshield?

These are about 90% representative of the flight membrane articles. They have similar coatings and for the most part, the overall construction of the membranes are identical.... As we deploy the sunshield, it unfolds... in a controlled, organized manner and that's allowing us to keep the membrane assembly or the sunshield safe during deployment.... After the membranes are going to deploy all the way out, then we are then going to tension the membranes and that's going to actually cause the 5 layers of the membrane to separate.

Our main concern right now is to test the membrane interaction with the subsystems of the sunshield to make sure everything is functioning as intended.

So when the test is done, will it look like the pictures we've seen of Webb?

Actually, it won't look exactly like the images. The overall shape and size of the membrane should be close. There are some differences that we won't be able to replicate here because we are deploying in 1G of gravity on earth. We won't be able to realize the real shape until we get up into space where it's 0G or a weightless environment.

Well thank you so much Judd for showing us what you guys do to test out the sunshield.

Sure, you're very welcome Mary.

The observatory needs to be protected from heat sources like our own Sun. The suntan lotions that you and I use have a maximum sun protection factor of about a hundred, or so. The Webb telescope sunshield has an estimated SPF of 1-million.

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