

James Webb Space Telescope backplane arrives at Marshall for testing

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The James Webb Space Telescope's backplane element arrives at the Marshall Center. Credit: NASA/MSFC/Fred Deaton

(Phys.org) —A major piece of the James Webb Space Telescope, the mirror's primary backplane support, arrived Aug. 22 at NASA's Marshall Space Flight Center in Huntsville, Ala., for testing in the X-ray and Cryogenic Test Facility. The backplane is the backbone of the telescope, supporting its 18 beryllium mirrors, instruments and other elements

while the telescope is looking into deep space.

The Webb Telescope is the world's next-generation [space observatory](#) and successor to the Hubble Space Telescope.

To prepare the telescope for the extreme temperatures of space, engineers at the facility have carefully examined the telescope's mirrors inside a [vacuum chamber](#) that simulates the hypercold of space, chilling the hardware from room temperature down to a frigid minus 414 degrees Fahrenheit. The backplane is the latest and final piece of the telescope to undergo this extreme conditioning at the Marshall Center.

The X-ray and Cryogenic Facility at the Marshall Center is the world's largest X-ray telescope test facility and offers a unique, cryogenic, clean-room optical test environment. Cryogenic testing will take place in a 7,600-cubic-foot, helium-cooled vacuum chamber, chilling the Webb support structure from room temperature to simulate the frigid atmosphere of space. While the structure changes temperature, test engineers will precisely measure its structural stability to ensure it will perform as designed in the extreme temperatures of space.

The cryogenic testing is targeted to begin in September.

"This testing of the backplane will verify limited movement of the structure when exposed to [cryogenic temperatures](#)," said Helen Cole, project manager for Webb Telescope mirror activities at the test facility. "This is important to overall performance of the telescope."



Crews unload the James Webb Space Telescope's "backplane," which was flown aboard a Lockheed C-5 airplane to NASA's Marshall Space Flight Center in Huntsville, Ala. Credit: NASA/MSFC/Fred Deaton

"Ensuring the best performance for the telescope requires evaluating the hardware at temperatures just as cold as in the environs of space," said Jeff Kegley, the test facility's manager. "This is the last in a series of Webb Telescope tests our facility has been performing since 2008; it's great to have the hardware here."

A joint project of NASA, the European Space Agency and the Canadian Space Agency, the Webb Telescope will observe the most distant objects in the universe, provide images of the first galaxies formed and see unexplored planets around distant stars. ATK built the backplane structure at its facility in Magna, Utah, under a contract with prime contractor Northrop Grumman.

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