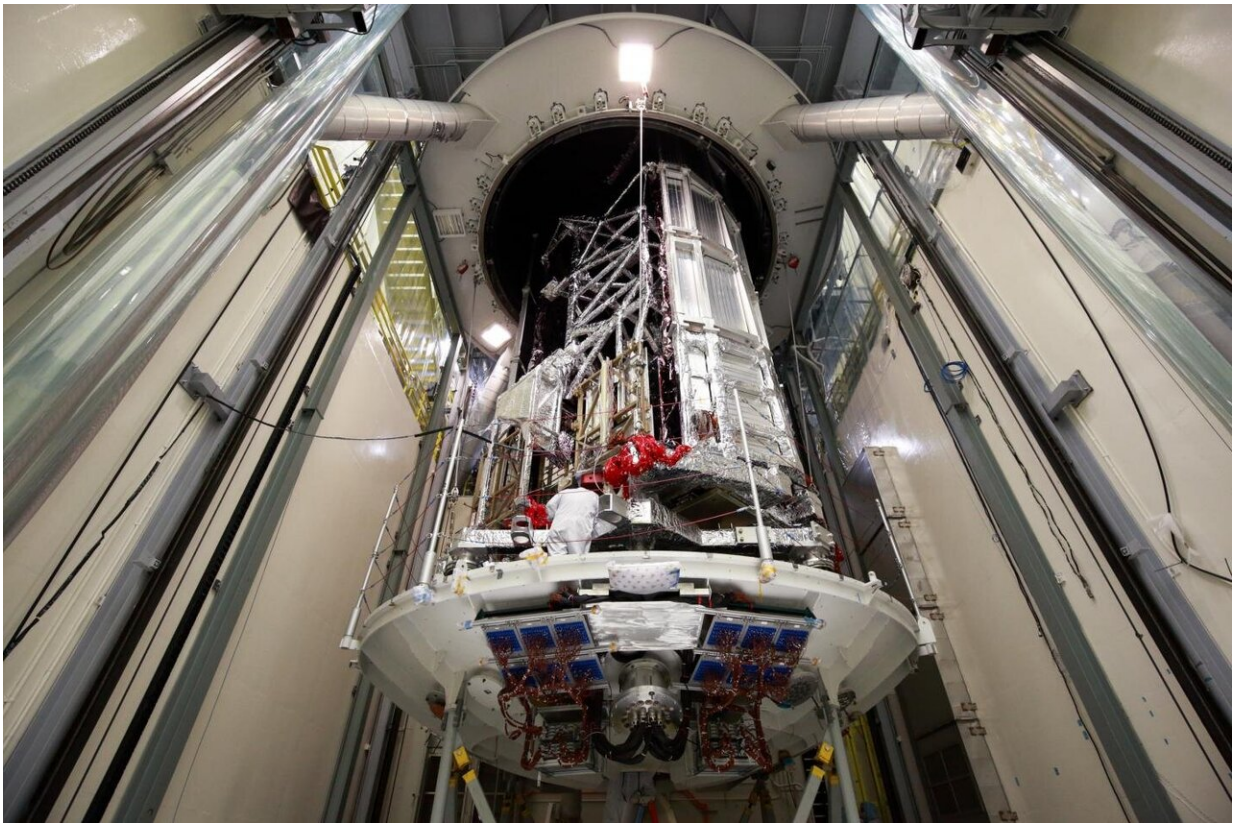


# James Webb Space Telescope emerges successfully from final thermal vacuum test

May 30 2019

---



The James Webb Space Telescope's spacecraft element being prepared for entry into Northrop Grumman's large thermal vacuum chamber in Los Angeles, California. Credit: Northrop Grumman

NASA's James Webb Space Telescope has successfully cleared another

critical testing milestone, taking this ambitious observatory one step closer to its 2021 launch. The spacecraft has gone through its final thermal vacuum test meant to ensure that its hardware will function electronically in the vacuum of space, and withstand the extreme temperature variations it will encounter on its mission.

One half of the Webb observatory, known as the "spacecraft element," completed this testing at the facilities of Northrop Grumman, the mission's lead industrial partner, in Los Angeles. The other half of Webb, which consists of the telescope and science instruments, has already successfully completed its [thermal vacuum testing](#) at NASA's Johnson Space Center in Houston prior to delivery at Northrop Grumman last year.

In the most recent major environmental [test](#), technicians and engineers locked the Webb spacecraft element inside a special thermal [vacuum](#) chamber. The testing team drained the atmosphere from the room to replicate the vacuum of space, and exposed the Webb spacecraft element to a wide range of hot and cold temperatures, spanning from minus 235 degrees Fahrenheit (minus 148 degrees Celsius) to a sweltering 215 degrees Fahrenheit (102 degrees Celsius). This variation of temperatures ensures the spacecraft will survive the extreme conditions it will actually experience in space.

The spacecraft element consists of the "bus," which is the equipment that actually flies the observatory in space, plus the revolutionary five-layer tennis-court-size sunshield that will keep Webb's sensitive optics and instruments in the shade, and at their required super-cold operating temperatures. The spacecraft element is imperative to the success of Webb's scientific goals, and must be thoroughly tested and validated for flight.



Technicians and engineers needed to take special precautions when preparing, and transporting Webb's spacecraft element for entry into Northrop Grumman's environmental testing chambers. Credit: Northrop Grumman



Webb's spacecraft being lifted into Northrop Grumman's thermal vacuum chamber for environmental testing to ensure that its hardware will function in the vacuum of space. Credit: Northrop Grumman

With the completion of this latest thermal vacuum test, all of Webb's components have been exposed to the varied conditions that they will encounter during launch, and while in orbit a million miles away from Earth.

"The teams from Northrop Grumman and NASA Goddard Space Flight Center are to be commended for a successful spacecraft thermal vacuum test, dedicating long hours to get where we are now," said Jeanne Davis, program manager for the James Webb Space Telescope Program. "This incredible accomplishment paves the way for the next major milestone,

which is to integrate the telescope and the spacecraft elements."

The next steps will be to join both halves of Webb to form the fully assembled observatory and complete a final round of deployments, testing and evaluation prior to launch. A full deployment of the [spacecraft](#) element will verify that Webb is ready to proceed to the launch site.

Provided by NASA's Goddard Space Flight Center

Citation: James Webb Space Telescope emerges successfully from final thermal vacuum test (2019, May 30) retrieved 25 April 2024 from <https://phys.org/news/2019-05-james-webb-space-telescope-emerges.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.