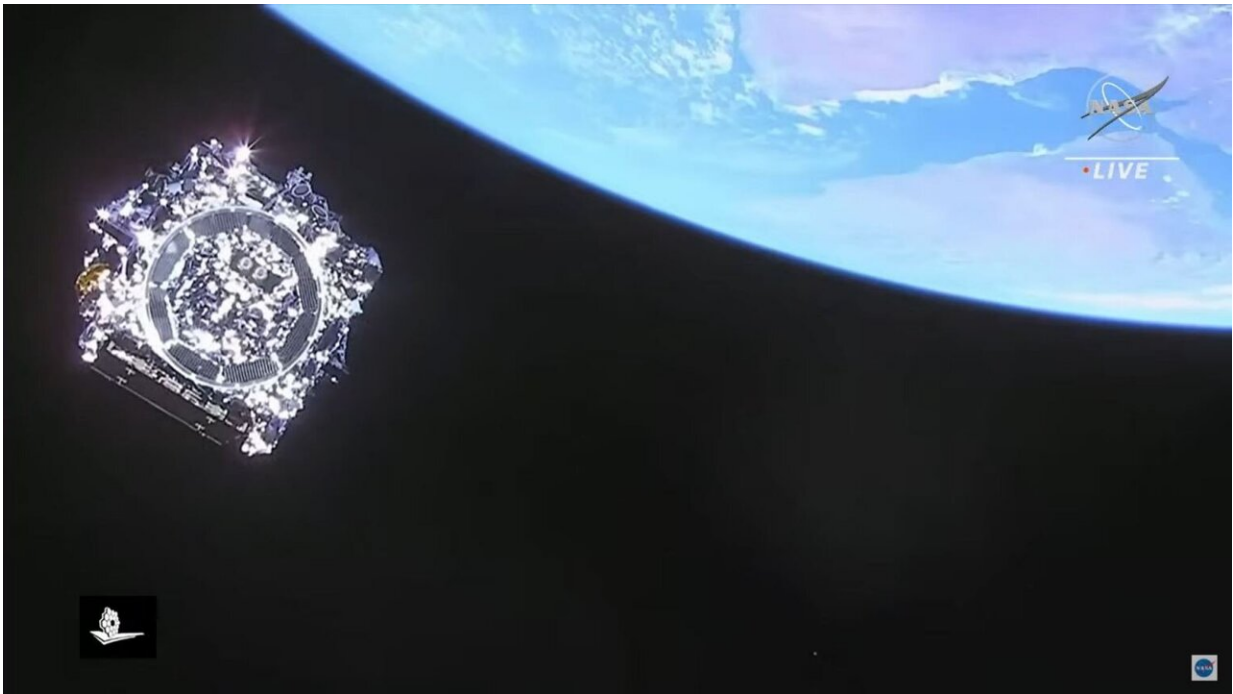


# Webb telescope deploys flap that will keep it oriented during its mission

January 5 2022, by Matt Williams

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Credit: NASA

On December 25, 2021, astronomers and space exploration enthusiasts got the greatest Christmas present of all—after years of delays, cost overruns and additional testing, the James Webb Space Telescope (JWST) launched from Europe's Spaceport in Kourou, French Guiana. In a real nail-biter, the Ariane 5 rocket and its precious payload reached orbit without a hitch. But as is so often the case, the deployment of the

JWST was just the first in a series of "hurry-up-and-wait" episodes.

Typically, periods of waiting are accompanied by plenty of worry and doubt. Luckily, there have been several positive developments since the JWST launched that could alleviate these anxieties. The latest is that the telescope successfully deployed its aft momentum flap, an instrument that will keep the telescope oriented during its mission. The news was announced yesterday (December 30) via [@NASAWebb](#), NASA's official Twitter account for the Webb telescope, and the JWST page at [NASA Blogs](#).

According to NASA Blogs, the deployment of the aft momentum flap began at 09:00 AM EST (06:00 AM PST) and lasted about eight minutes. During this time, the mission team released the flap's hold-down devices while a spring brought the flap into its final position. The purpose of this flap is to maintain the observatory's orientation to minimize the fuel engineers will need to make corrective adjustments throughout the mission.

All of this comes down to the telescope's [sunshield](#), a key component aboard the JWST designed to keep the telescope's mirrors at a constant temperature of less than 50 K. This ensures that the telescope can fulfill its mission objectives and make highly sensitive observations in the infrared spectrum. However, a small drawback of the sunshield is that solar radiation exerts pressure on its surface, much like a solar sail.

This solar pressure would cause the observatory to rotate in space, which would otherwise have to be corrected by the telescope's reaction wheels. The aft momentum flap compensates for this by offsetting [solar radiation](#) pressure, much like how a trim tab counteracts hydro- or aerodynamic to keep a boat or aircraft in a stable position. This flap is one of several components (along with the telescope's pallet structures, momentum flap and mid-booms) that will help keep the JWST steady as

it attempts to unfurl its sunshield.

This will be the next point in the JWST's deployment schedule and will consist of several steps. The first took place earlier today and saw the release of the sunshield covers. "This operation releases and rolls up the protective membrane cover," according to the JWST website. "The sunshield release cover has been protecting the membranes during ground and launch activities. Release devices are electrically activated to release the covers."

With the covers unfurled, the mission team will proceed to extend the five membranes of the sunshield outwards. After that, the next step will be to "tension" the sunshield, a two-day operation to ensure that all five membranes are pulled taught. Only then will the mirror be fully deployed, which will consist of positioning the secondary mirror, releasing the Aft Deployed Instrument Radiator (ADIR), then deploying the primary mirror wings.

This is expected to be finished by Friday, January 7, 13 days after launch. After a brief period of testing the individual mirror segments (moving each in and out of place). The deployment process is expected to take until early to mid-January to complete. By the end of the month, [mission](#) controllers expect to have the JWST in position at the sun-Earth L2 Lagrange point, where it will begin to collect light later in 2022.

The full deployment schedule can be [found here](#), along with animations of each step. Be sure to check out the full deployment video below as well:

Provided by Universe Today

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