

NASA engineers testing Webb telescope's OSIM and BIA instruments

April 12 2012, by Rob Gutro



Credit: NASA Goddard/Chris Gunn

(Phys.org) -- Several critical items related to NASA's next-generation James Webb Space Telescope are being tested in the giant thermal vacuum test chamber at NASA's Goddard Space Flight Center, Greenbelt, Md.

These photos show the OTE ([Optical Telescope](#) Element) Simulator or

OSIM wrapped in a silver blanket on a platform, being lowered down into a [vacuum chamber](#) (called the Space Environment Simulator, or SES) by a crane to be tested to withstand the cold temperatures of space.

The OSIM simulates the Webb telescope for the purposes of testing the science instruments that will fly on the observatory. The OSIM itself will never fly into space, but it is a vital part of the testing program to verify that the science cameras and spectrographs will function as planned.

The actual telescope known as the OTE is the eye of the James Webb Space [Telescope observatory](#). The OTE will gather the light coming from space and provide it to the Webb's science instruments. Webb needs a large mirror to collect as much light as possible to see galaxies from the [beginning of the Universe](#) and to detect other faint astronomical sources.



Credit: NASA Goddard/Chris Gunn

A second piece of equipment called the Beam Image Analyzer (BIA) will shortly be mounted on top of the OSIM for the cryo-vacuum test. The BIA incorporates a number of sensors that are used to verify the quality of the OSIM simulation of the OTE. Once the fidelity of the OSIM as an OTE surrogate has been confirmed by the upcoming cryo-test, the next use of the OSIM will be next year, when the [science instruments](#) mounted in the Integrated [Science Instrument Module](#) (ISIM) will go into the test chamber, to be fed by the OSIM [light beams](#), for critical focus and alignment checks at [cryogenic temperatures](#).

The ISIM is one of three major elements that comprise the Webb Observatory flight system. It will house the four main instruments that will detect light from distant [stars and galaxies](#), and planets orbiting other stars. The structure is like a chassis in a car providing support for the engine and other components.

The upcoming careful and exacting testing of the OSIM and BIA "stand-ins" is essential as it helps to ensure that this complex mission will be successful and will perform in the harsh environment of space.

The NASA Goddard Space Flight Center Space Environment Simulator (SES) is a big vacuum chamber where scientists and engineers cryo-tested the OSIM and BIA and lowered the temperature of the structures to 42 Kelvin (-384.1 Fahrenheit or -231.1 Celsius) and below to ensure that it can withstand the frigid temperatures of space.

Test articles are loaded through the top of the chamber using the building bridge crane. Smaller test articles, personnel, and equipment enter through a side door at the chamber. Randy Kimble, Integration and

Test Project Scientist for the [James Webb Space Telescope](#) at NASA's Goddard noted, "Another critical set of equipment for this test is a pair of precise cameras on a rotating boom, which hang from the ceiling of the thermal shroud inside the chamber; these cameras provide precise positional measurements to further confirm the fidelity of the OSIM simulation of the optical output of the OTE."

More information: www.jwst.nasa.gov/

Provided by JPL/NASA

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