

NASA's James Webb Space Telescope Primary Mirror Built by Ball Aerospace Fully Assembled

The 18th and final primary mirror segment is installed on what will be the biggest and most powerful space telescope ever launched. The final mirror installation Wednesday at NASA's Goddard Space Flight Center in Greenbelt, Maryland marks an important milestone in the assembly of the agency's James Webb Space Telescope.

"Scientists and engineers have been working tirelessly to install these incredible, nearly perfect mirrors that will focus light from previously hidden realms of planetary atmospheres, star forming regions and the very beginnings of the Universe," said John Grunsfeld, associate administrator for NASA's Science Mission Directorate in Washington. "With the mirrors finally complete, we are one step closer to the audacious observations that will unravel the mysteries of the Universe."

Using a robotic arm reminiscent of a claw machine, the team meticulously installed all of Webb's primary mirror segments onto the telescope structure. Each of the hexagonal-shaped mirror segments measures just over 4.2 feet (1.3 meters) across -- about the size of a coffee table -- and weighs approximately 88 pounds (40 kilograms). Once in space and fully deployed, the 18 primary mirror segments will work together as one large 21.3-foot diameter (6.5-meter) mirror.

"Completing the assembly of the primary mirror is a very significant milestone and the culmination of over a decade of design, manufacturing, testing and now assembly of the primary mirror system," said Lee Feinberg, optical telescope element manager at Goddard. "There is a huge team across the country who contributed to this achievement."

While the primary mirror installation may be finished on the tennis court-sized infrared observatory, there still is much work to be done.

"Now that the mirror is complete, we look forward to installing the other optics and conducting tests on all the components to make sure the telescope can withstand a rocket launch," said Bill Ochs, James Webb Space Telescope project manager. "This is a great way to start 2016!"

The mirrors were built by Ball Aerospace & Technologies Corp., in Boulder, Colorado. Ball is the principal subcontractor to Northrop Grumman for the optical technology and optical system design. The installation of the mirrors onto the telescope structure is performed by Harris Corporation, a subcontractor to Northrop Grumman. Harris Corporation leads integration and testing for the telescope.

"The Harris team will be installing the aft optics assembly and the secondary mirror in order to finish the actual telescope," said Gary Matthews, director of Universe Exploration at Harris Corporation. "The heart of the telescope, the Integrated Science Instrument Module, will then be integrated into the telescope. After acoustic, vibration, and other tests at Goddard, we will ship the system down to Johnson Space Center in Houston for an intensive cryogenic optical test to ensure everything is working properly."

The James Webb Space Telescope is the scientific successor to NASA's Hubble Space Telescope. It will be the most powerful space telescope ever built. Webb will study many phases in the history of our universe, including the formation of solar systems capable of supporting life on planets similar to Earth, as well as the evolution of our own solar system. It's targeted to launch from French Guiana aboard an Ariane 5 rocket in 2018.

Webb is an international project led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency.

Ball Aerospace & Technologies Corp. supports critical missions for national agencies such as the Department of Defense, NASA, NOAA and other U.S. government and commercial entities. The company develops and manufactures spacecraft, advanced instruments and sensors, components, data exploitation systems and RF solutions for strategic, tactical and scientific applications. Ball continues to invest and innovate in affordable, high resolution imaging systems, contributing to the needs of civil, military and commercial customers. For more information, visit www.ballaerospace.com.

Ball Corporation (NYSE: BLL) supplies innovative, sustainable packaging solutions for beverage, food and household products customers, as well as aerospace and other technologies and services primarily for the U.S. government. Ball Corporation and its subsidiaries employ 14,500 people worldwide and reported 2014 sales of \$8.6 billion. For more information, visit www.ball.com, or connect with us on Facebook or Twitter.

Forward-Looking Statements

This release contains "forward-looking" statements concerning future events and financial performance. Words such as "expects," "anticipates," "estimates" and similar expressions identify forward-looking statements. Such statements are subject to risks and uncertainties, which could cause actual results to differ materially from those expressed or implied. The company undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. Key risks and uncertainties are summarized in filings with the Securities and Exchange Commission, including Exhibit 99 in our Form 10-K, which are available on our website and at www.sec.gov. Factors that might affect: a) our packaging segments include product demand fluctuations; availability/cost of raw materials; competitive packaging, pricing and substitution; changes in climate and weather; crop yields; competitive activity; failure to achieve productivity improvements or cost reductions; mandatory deposit or other restrictive packaging laws; customer and supplier consolidation, power and supply chain influence; changes in major customer or supplier contracts or loss of a major customer or supplier; political instability and sanctions; and changes in foreign exchange or tax rates; b) our aerospace segment include funding, authorization, availability and returns of government and commercial contracts; and delays, extensions and technical uncertainties affecting segment contracts; c) the company as a whole include those listed plus: changes in senior management; regulatory action or issues including tax, environmental, health and workplace safety, including U.S. FDA and other actions or public concerns affecting products filled in our containers, or chemicals or substances used in raw materials or in the manufacturing process; technological developments and innovations; litigation; strikes; labor cost changes; rates of return on assets of the company's defined benefit retirement plans; pension changes; uncertainties surrounding the U.S. government budget, sequestration and debt limit; reduced cash flow; ability to achieve cost-out initiatives; interest rates affecting our debt; and successful or unsuccessful acquisitions and divestitures, including, with respect to the proposed Rexam PLC acquisition, the effect of the announcement of the acquisition on our business relationships, operating results and business generally; the occurrence of any event or other circumstances that could give rise to the termination of our definitive agreement with Rexam PLC in respect of the acquisition; the outcome of any legal proceedings that may be instituted against us related to the definitive agreement with Rexam PLC; and the failure to satisfy conditions to completion of the acquisition of Rexam PLC, including the receipt of all regulatory approvals.

For further information: Media Contact: Roz Brown or call 303-939-6146

<https://ball.mediaroom.com/2016-Feb-4-NASAs-James-Webb-Space-Telescope-Primary-Mirror-Built-by-Ball-Aerospace-Fully-Assembled>