National Aeronautics and Space Administration

Space Technology Game Changing Development

Monthly Highlights

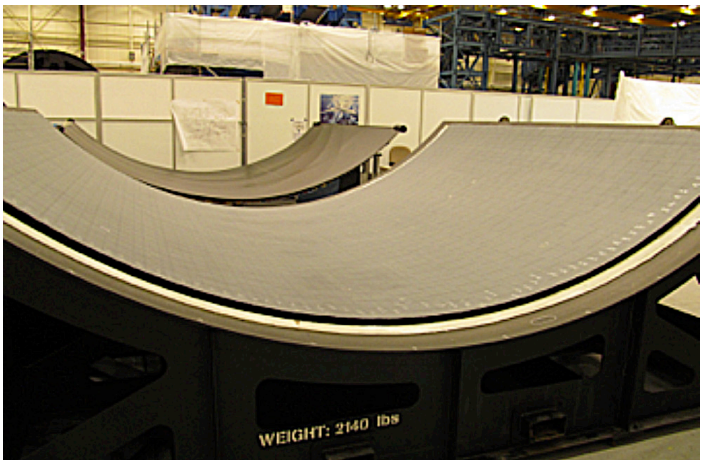
May 2013

Composite Cryotank Work Progresses

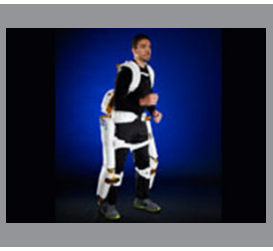
Work on the 5.5 meter composite cryotank is well underway at The Boeing Company in Seattle, WA. The 5.5 meter tank will be the largest automated fiber placement, out-of-autoclave, composite liquid hydrogen tank ever designed, manufactured and tested. Using innovative manufacturing processes and designs, the project is pushing the technology boundaries. “Out-of-autoclave” manufacturing is a revolutionary new technology for composites and provides an alternative to the traditional high-pressure autoclave curing process commonly used by the aerospace industry.

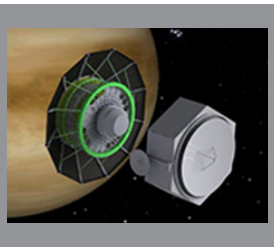
The success of this project could lead to rocket propellant tanks that are more than 30 percent lighter and 25 percent lower in cost to manufacture compared to the current state-of-the-art metallic tanks. Such advancements offer less cost for payload delivery to orbit and the potential of enabling advanced human and robotic space exploration missions. This innovative technology has applications for multiple stakeholders in the rocket propulsion community.

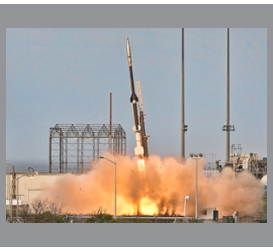
The 5.5 m tank undergoes Automated Fiber Placement at Boeing.



These flute segments will make up the skirt of the tank.







NASA Administrators Visit Glenn Research Center

NASA's Deputy Administrator Lori Garver and Associate Administrator of NASA's Space Technology Mission Directorate Mike Gazarik visited the Glenn Research Center in Cleveland in May. Above left, Gazarik discusses the advanced manufacturing research being conducted at Glenn's Research Combustion Laboratory.

Above right, Pratt and Whitney Rocketdyne project manager Jeff Haynes says partnering with NASA helps the company refine manufacturing techniques to improve design and productivity. Pratt and Whitney Rocketdyne additively manufactured an injector to be incorporated into a hot fire engine test.

Game Changing Development Program Director Steve Gaddis gave an overview of the Space Technology Mission Directorate to those attending the agency's Office of Legislative & Intergovernmental Affairs (OLIA) Strategic Planning Retreat, held at NASA's Langley Research Center May 2.

What is Game Changing? Cue Video!

The latest **NASA X** show featuring the Game Changing Development Program is now available to download. The show details the origins of the program and highlights several projects, including Human Robotic Systems' X1 and Composite Cryotanks. The show, which has already reached millions both in the U.S. and internationally, has been downloaded 175,000 times from the NASA portal. In addition, 420 television stations have downloaded the program and Bangkok Air is the first airline to pick it up.

Haven't watched it yet? Check it out at any of these links:
http://www.nasa.gov/nasax
http://www.hulu.com/nasa-x
http://archive.org/details/NasaX_program4

Game On!

http://gameon.nasa.gov

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