

Composites for Exploration Project

Advanced Exploration Systems Program | Human Exploration And Operations
Mission Directorate (HEOMD)



ABSTRACT

A key goal for the Composites for Exploration (CoEx) Project is to develop high payoff dry composite structures and materials technologies with direct application to enable NASA's future space exploration needs, with a focus on large scale, dry composite structures representative of a payload fairing for large launch vehicles.

ANTICIPATED BENEFITS

To NASA funded missions:

Anticipated benefits of this technology for funded missions include substantial weight and cost savings over current metallic launch vehicle structures.

To NASA unfunded & planned missions:

Anticipated benefits of this technology include substantial weight and cost savings over current metallic launch vehicle structures.

To other government agencies:

Anticipated benefits of this technology include substantial weight and cost savings over current metallic launch vehicle structures.

To the commercial space industry:

Anticipated benefits of this technology include substantial weight and cost savings over current metallic launch vehicle structures.

To the nation:

Anticipated benefits of this technology include substantial weight and cost savings over current metallic launch vehicle structures.

DETAILED DESCRIPTION

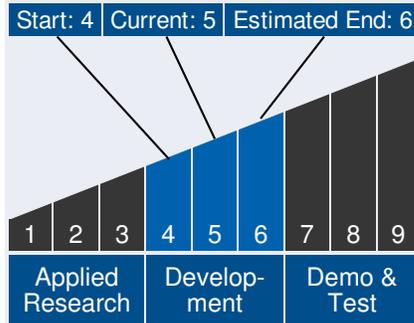
The project will devise test and development approaches to support development of large scale composite payload fairing structures, including conducting tests and analyzes of structures that are representative of a 10 m diameter composite payload



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Technology Maturity



Management Team

Program Director:

- Jason Crusan

Program Executive:

- John Warren

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fairing for a 100 to 130 mt Space Launch System (SLS). The project will develop test procedures for large composite structures testing and fabricate a 1/6th-arc panel for a 10 m diameter composite fairing to demonstrate full-scale materials and manufacturing technologies for composite payload fairing structures.

Management Team *(cont.)*

Project Manager:

- Keith Woodman

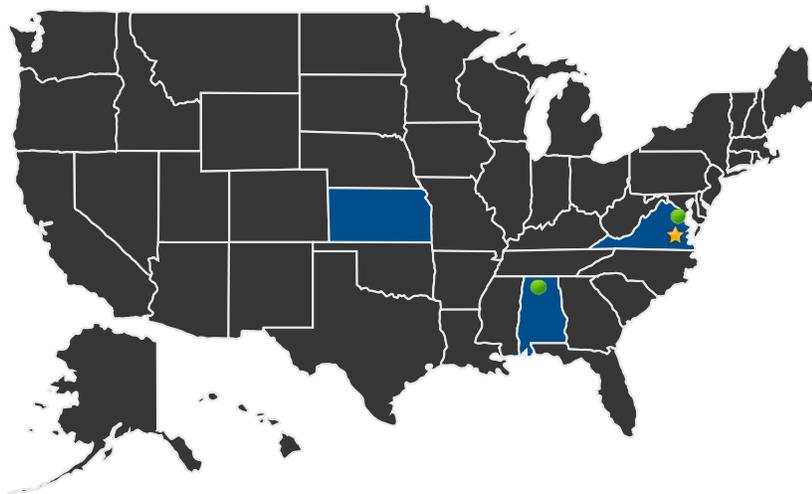
Technology Areas

Primary Technology Area:

Materials, Structures, Mechanical Systems and Manufacturing (TA 12)

- └ Structures (TA 12.2)

U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States
With Work

★ **Lead Center:**
Langley Research Center

● **Supporting Centers:**

- Marshall Space Flight Center
- NASA Headquarters

Other Organizations Performing Work:

- SpiritAerosystems

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DETAILS FOR TECHNOLOGY 1

Technology Title

Composites for Exploration

Technology Description

This technology is categorized as a material for manned spaceflight

The project will devise test and development approaches to support development of large scale composite payload fairing structures, including conducting tests and analyzes of structures that are representative of a 10 m diameter composite payload fairing for a 100 to 130 mt Space Launch System (SLS). The project will develop test procedures for large composite structures testing and fabricate a 1/6th-arc panel for a 10 m diameter composite fairing to demonstrate full-scale materials and manufacturing technologies for composite payload fairing structures.

Capabilities Provided

This technology offers the potential for substantial weight and cost savings over current metallic launch vehicle structures. Dry composite launch vehicle structures could provide as much as 25 to 40 percent in weight savings and 20 to 25 percent cost savings. Lower density materials enable the weight savings, and reduced part count and automated manufacturing for integrated structural concepts enable the cost savings.

Potential Applications

This technology would have applications for large launch vehicle systems fairings and structures where lighter weigh and lower cost structures/components are needed.

Performance Metrics

Metric	Unit	Quantity
Costs Savings	%	20
Weigh Savings	%	25