



College of Engineering
Department of
Mechanical & Industrial Engineering

The Sidney E. Fuchs Seminar Series

3:00-3:50pm, Friday, November 6th, 2015
Frank H. Walk Design Presentation Room



Composite Structures Repair Development at Kennedy Space Center

by **Sarah Cox***

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The National Aeronautics and Space Administration (NASA) is developing research and technology to travel beyond low earth orbit. In order to successfully launch humans and cargo for long duration space missions, NASA must understand the challenges and go beyond current state of the art technologies to prepare for such missions. Carbon fiber reinforced composites are becoming more common for primary structural use in launch vehicles and spacecraft. Recent NASA projects, such as the Composites for Exploration Project (CoEx) and Composite Cryotank Technology Demonstration (CCTD), have started to develop new processes to expand the use of composite structures for aerospace applications. Composite repair development is important for the supportability and maintainability of structures and can prevent hardware replacement and lengthy delays. The primary focus of composite development at Kennedy Space Center for both CoEx and CCTD was developing repair methods which could be performed in the field. Sandwich panels were fabricated, impacted, and repaired using several repair patch methods. Test panels were analyzed via nondestructive evaluation to assess the damage and the acceptability of the repair. The panels were then destructively tested to compare their effectiveness at restoring the integrity of the composite.

* Ms. Sarah Cox is a Materials Engineer in the Materials and Process Engineering Branch at Kennedy Space Center. Her main focus is on composite materials and structures in aerospace applications. She has been the lead at Kennedy Space Center (KSC) for several interagency composite structures projects, which involved performing materials testing and developing composite repairs. She has been supporting a KSC payload project which is building a plant growth chamber using a composite sandwich structure. This project has involved developing requirements and the manufacturing process, performing mechanical and compatibility testing, and designing and building the chamber. Ms. Cox also supports the Commercial Crew Program Composites Team. Ms. Cox earned a Bachelor of Science in Aerospace Engineering from the Georgia Institute of Technology in 2004. In 2014, she completed her Master of Science in Materials Science and Engineering at the University of Central Florida.