Composite Conference 2012

Composites for Space Applications

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Remarks

- Welcome to Composite Conference 2012
- Special thanks and welcome to participants in the NASA Composite Summit that started this collaboration.
- Special Thank You!
  - Joshua Jackson (MKF), Harold Beeson (NASA), James Fekte (NIST) and Antonio Ruiz (DOE) for chairing the conference
  - Session chairs and all NASA and NIST staff who worked hard to organize the conference with MKF
  - New Mexico State DACC's president Dr. Margie Huerta for hosting us in the East Mesa Facility
  - Angelique Lasseigne (G2M2) Crystal Lay (NMSU Mechanical and Aerospace Engineering) and Charles Nichols (NASA) for making STEM student sponsorship possible.

Why are we here?

- Need high strength materials in mass and cost constrained applications
  - Additional knowledge needed to use composites in our applications more efficiently
  - Non-homogenous material
  - Anisotropic structures
  - Viscoelastic response to loading
  - Multiple material interfaces
- Composite use in space systems requires
  - Advanced structural models
  - Life and failure mode prediction
  - Harmonized codes and standards
  - Materials and processes that address composite component variability
  - Reliable nondestructive evaluation

NASA's Use of Composites

Future Composite Space Vehicles (NASA's Composite Crew Module)

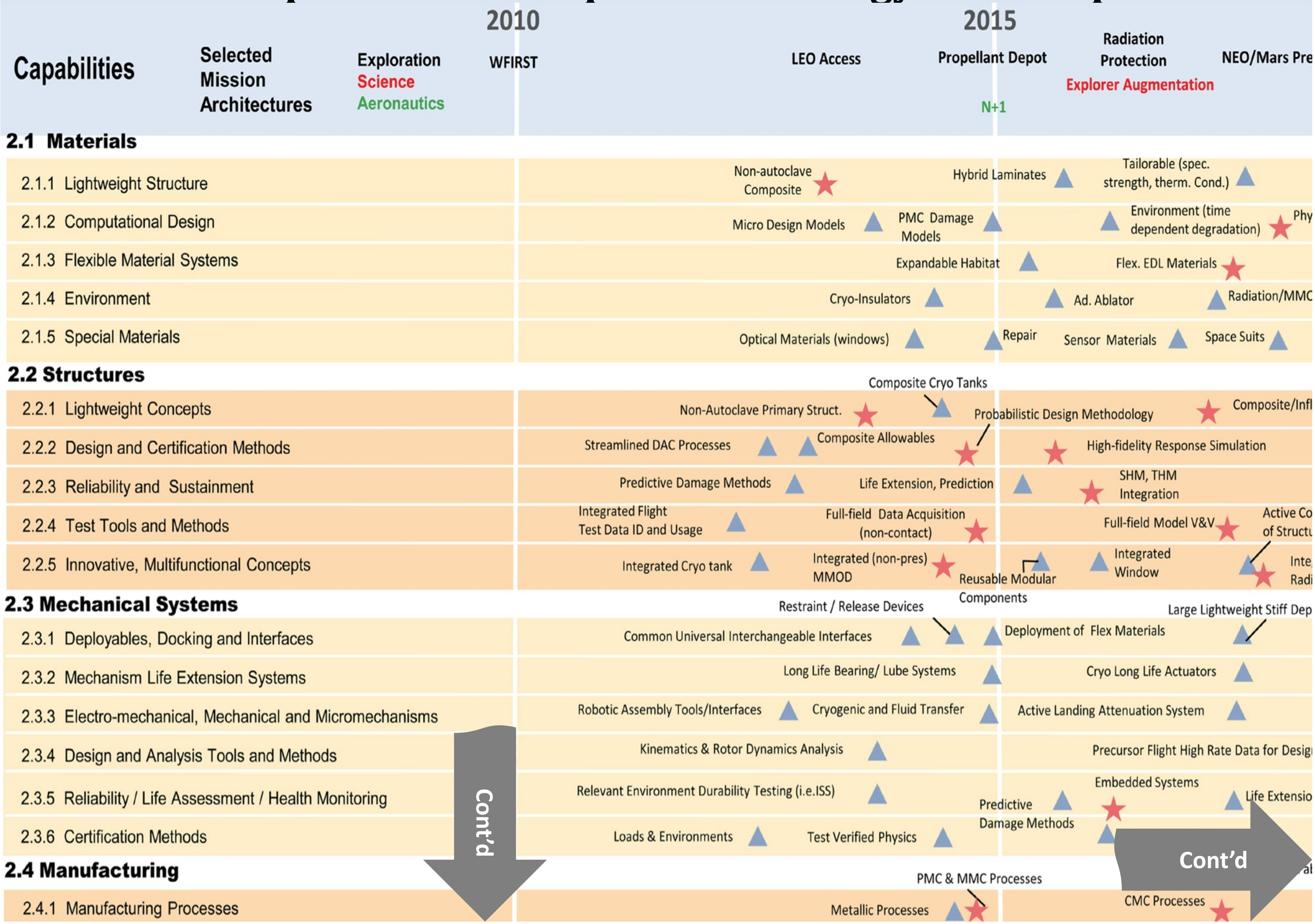
Growth in Composite use

Future	NASA Space Technology Roadmaps	Composite is Cross cutting technology, TA12, TA7
Today	NASA's COTS & CCDEV Vehicles	Composite Pressure Vessels Composite Structure
Today	Space Launch System	Composite Pressure Vessels Composite Structure
Today	Orion	Composite Pressure Vessels
1990s	International Space Station	Composite Pressure Vessels
1970s	Space Shuttle	Composite Pressure Vessels Composite Wing Leading Edge
1960s	Apollo	Pre-composites

Crosscutting for Space Technology Roadmaps

- Composites are a crosscutting technology for NASA's future missions.
  - Low Earth Orbit Access and Propellant Depots (2015)
  - Mars Precursor Missions & Heavy Lift Vehicle (2020)
  - Advanced In-space Propulsion (2025)
  - Space Platforms (2030)
- Information on technology roadmaps can be found at: http://www.nasa.gov/offices/oct/home/roadmaps/index.html

Composites Need: Space Technology Roadmap



Accelerated Growth in Composites

- Barriers to Growth
  - Funding limitations
  - Cross disciplinary technological challenges
  - Maturity required to meet roadmap dates
- Steps to Accelerate Growth
  - U.S. intra-government collaboration
  - Government-industry partnerships
  - International communication and collaboration
  - Globally harmonized roadmaps for key technologies

NASA-Commercial Collaboration┬
Charlie Bolden (NASA) and
Elon Musk: (Space X)

Let's Go!

- Address the global challenge of using composites in our applications by addressing common issues
- Excited to meet with leaders who are advancing composites in their applications
- Keep up with a paradigm shift from metals to composites occurring in aerospace, automotive, marine, and pipelines

www.compositeconference.com