

## AEROSPACE COMPOSITE STRUCTURES: APPLICATIONS/DESIGN/ANALYSIS

**Dr Christos C. Chamis (ASME Fellow)**

Senior Aerospace Scientist  
NASA Lewis Research Center  
Cleveland, Ohio

### ABSTRACT

Fiber composites are an emerging material with tailoring potential to achieve substantially “better-cheaper-faster” and even “greener” products. The lecture provides an overview on the advantages of composites design/analysis methods and applications. The review will synoptically cover analysis methods that span all composites scales from constituents (fiber, matrix) and fabrication process to structural optimization. Several typical composites applications to aerospace structures are presented to demonstrate specific advantages of composites in these structures. Recent application to space station, advanced satellites and X-33 are included as are potential applications of smart composite structural concepts for aerospace applications. Emerging simulation methods to evaluate the reliability and risk of aerospace composite structures are summarized. The presentation provides a broad perspective of what can be done with composites and the state of the composites technology readiness to meet even greater application challenges in aerospace structures.