



“Using an ICME approach for composite materials development in aerospace”

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Abstract: An introduction to Boeing and a brief description of composites on the 787 as a lead-in to a new theory under development to explain ultimate performance in composites called onset theory. The theory will be used as a basis for new materials development, a multi-scale approach will be described with emphasis on molecular dynamics as a virtual formulation tool. The effort has led to “new” molecule synthesis soon to be evaluated experimentally.

Speaker Bio: Stephen Christensen has worked for Boeing since 1978 and in the aerospace industry for over 37 years. Assignments have included materials development for the B-1, 757, 767, Advanced Tactical Fighter (now F-22), numerous special projects and the Joint Strike Fighter. Research emphasis since mid-1990's has been on the development of a deformation based understanding of composite constituent materials performance known as Onset Theory with emphasis on improving polymer distortional deformation as the key to increased composite performance. Over the past eight years we have been developing computational simulations in order to more rapidly understand the structure-property relationships of polymer matrix materials, polymer-fluid interactions, chemical reactivity and environmental resistance with the aim of developing composite matrix chemistries that exploit the teachings of onset theory.