

**Alan I. Taub, Ph.D.**

**University of Michigan**

**Professor, Materials Science & Engineering and Mechanical Engineering**

**Senior Technical Advisor, Lightweight Innovations for Tomorrow (LIFT)**

**“Addressing the Challenges of Lightweighting for Transportation by Integrating Mechanical and Materials Research”**

**Abstract**

The potential for reducing weight in automobiles, ships and aircraft using high-strength steel, aluminum, titanium and magnesium alloys and polymer composites is well established. The challenge is to achieve the weight reduction at the right value to the user. Optimization of the material properties and processes together with robust design tools and joining technologies to enable multi-material structures is required. This has become possible through co-development of the material, the component design and the manufacturing process using state-of-the-art Integrated Computational Materials Engineering (ICME) models. The development of agile manufacturing processes is also a key enabler.

The role of Lightweight Innovations for Tomorrow (LIFT) and its connection with the University of Michigan in developing new these new lightweighting technologies will be highlighted. LIFT is one of the Manufacturing USA Institutes and was established to accelerate the adoption of advanced metal structures. It serves as the bridge between basic research and final product commercialization. Finally, the goals of the newly launched Michigan Materials Research Institute (MMRI) will be discussed, particularly with respect to how faculty can get engaged.