

*The Globe, the Car, and the Engineer:
A Tale about Producing the Most Complex Consumer Product on Earth.*

by

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The automobile is a truly complex consumer product whose design and manufacturing is influenced by national and international policies. Over the last century, the design, manufacture and operation of the automobile have grown into complex system integration paradigms cutting across applications of traditional disciplines in physical sciences, engineering, social and behavioral sciences and business. For example, strict emissions regulations are driving research and development in advanced engine concepts running on conventional and alternative fuels and hybrid vehicular powertrains. Conversely, there are a number of issues generated by the automotive industry that drive policy. For example, many manufacturers are providing electronic stability control systems (ESC) as optional equipment in their current products. However, the crash avoidance benefit of these ESCs is so significant that a US Federal rule is proposed to phase in ESCs in all new passenger cars from model year 2009.

This seminar presents the importance of the automobile to the global society, and why one can still produce cars in the United States and make a profit. There are a multitude of research areas that are critical for vehicle development that directly affect society in major ways (e.g., safety, emissions and energy). Current global research is addressing manufacturing of these complex systems out of advanced materials advanced materials that are shaped into complex geometries, with increasing precision at ever reduced costs. This talk presents an overview of some of the new manufacturing technologies and processes that are being developed to move the automotive sector into and through the twenty-first century. New opportunities are presented that result from the advanced process developments and capabilities. Target technologies such as high-speed machining, ultra-precision machining, advance metrology and next generation computing applications are presented in the context of automotive production.

The talk concludes with an overview of manufacturing possibilities in the United States. The opportunities available for manufacturing in the U.S. are discussed as well future trends for international manufacturing and the potential road blocks that could limit future potential.