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L2D2 Auditorium

A Look at Combining Additive Manufacturing Techniques with Subtractive Processes

This seminar outlines a direct manufacturing technique that combines additive and subtractive manufacturing techniques to allow the rapid production of functional high performance mechanical components in short period. This talk will provide an overview of pioneering rapid capability to make parts with complex freeform geometries as provided by an Electron Beam Melting (EBM) machine as provided by CNC by using these processes sequentially but automatically. We have developed two significant advances: 1) Using sacrificial fixtures produced during the additive manufacturing for locating and securing the part during the subtractive process, and 2) For subtractive processing, use a layered method so that no CNC programming is required for producing the part, using “island milling” with a very small depth of cut. These developments will bring this *Make Bottom* method to reality through the development of an integrated additive and subtractive manufacturing system using existing machines, e.g., an EBM and a 5 axis CNC machining center.

Richard A. Wysk is the Dopaco Distinguished Professor of Industrial and Systems Engineering at North Carolina State University. He received his Ph.D. (1977) in Industrial Engineering from Purdue University. Dr. Wysk's research and teaching interests are in the general area of Computer Integrated Manufacturing (CIM) and medical device development. In particular, he is interested in Lean Manufacturing, Computer-Aided Process Planning and Flexible Manufacturing Systems (FMSs) planning, design and control and the development of bioactive engineered surfaces. Dr. Wysk has coauthored seven books including *Computer-Aided Manufacturing*, the 1991 IIE Book of the Year and the 1991 SME Eugene Merchant Book of the Year. Dr. Wysk is an IIE Fellow, a Fellow of SME, a member of Sigma Xi, and a member of Alpha Pi Mu and Tau Beta Pi.