



## Digital Disruption of Composites

Manufacturing & Design

Anoush Poursartip *The University of British Columbia*

### A B S T R A C T

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Composite materials and structures are an excellent example of how engineering practice often outpaces scientific knowledge. Born in the analog world of the 1960s, carbon-fibre composites manufacturing and design practice is a complex and often fragile construct that is primarily driven by the need to manage uncertainty and risk. In the last two decades, the packaging of knowledge in the form of predictive simulation supported by characterized materials and standardized workflows has started to change this paradigm, but the best is yet to come.

In this presentation, Dr. Poursartip charts the history of process simulation and in-process measurement & control to highlight how scientific knowledge is becoming good enough to disrupt current engineering practice. Dr. Poursartip will posit that the specific needs of our domain can only be met with the strategic and careful merging of two previously separate digital threads, namely science-based Integrated Computational Materials Engineering (ICME) with data-based Industry 4.0. Using examples from his own 40-year career bridging academic research and industrial practice, Dr. Poursartip will highlight how digital strategies will be even more important to our community as we emerge from the current economic crisis.



## **Anoush Poursartip**

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### B I O

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Dr. Poursartip has worked in digital manufacturing for over thirty years. He has focussed on the manufacturing of advanced composites structures, primarily for the aerospace sector. Initially, his digital focus was the development of computer simulations of the manufacturing process to reduce risk, cost, and time for product development. This work led to the founding of Convergent Manufacturing Technologies in 1998, and the 2012 founding of the Composites Research Network at UBC. As Industry 4.0 technologies have become more available, Dr. Poursartip's interests have broadened into the bigger concept of the digital twin – identifying the manufacturing conditions in a factory which should be measured, how to measure them, and how to relate them to the quality of the product and the efficiency and robustness of the factory.

Dr. Poursartip is a recipient of the Medal of Excellence in Composites from the University of Delaware and the ASTM Wayne Stinchcomb Award. He is a Fellow of the Canadian Academy of Engineering, ICCM, and SAMPE.