

**PROFESSOR JOSEPH H. KOO***The University of Texas at Austin***ABSTRACT*****Fundamentals, Properties, and Applications of Polymer Nanocomposites***

The introduction of inorganic nanomaterials as additives into polymers has resulted in polymer nanocomposites exhibiting a multiplicity of high-performance characteristics beyond what traditional polymeric composites possess. These “multifunctional” features attributable to polymer nanocomposites consist of improved properties, such as thermal, flame, ablation, electrical, moisture, chemical, permeability, and others. Through control/alteration of the additive at the nanoscale level, one is able to maximize property enhancement of selected polymer systems to meet or exceed the requirements of current commercial, military, and aerospace applications. This seminar includes: an overview of different nanomaterials, processing techniques, and selective examples to examine the behavior of polymer nanocomposites for applications, such as re-entry vehicles, rocket engines, additive manufacturing, and fire protection.

**Date:** Tuesday August 14, 2018  
**Time:** 12.30 - 2.00pm  
**Location:** AMP Building 55, RMIT City Campus



**ABOUT THE SPEAKER**

Dr. Koo has over 40 years of industrial and academic experience in program and engineering management. Currently, he is Sr. Research Scientist/Research Professor/Director of Polymer Nanocomposites Technology Lab in the Dept. of Mechanical Engineering at The University of Texas at Austin, Austin, TX. Dr. Koo is the founder of KAI, LLC and currently serves as Vice President and CTO. He is a SAMPE Fellow and Chairman of the SAMPE Nanotechnology Committee. Dr. Koo is an Associate Fellow of AIAA and Past-Chair of the AIAA Materials Technical Committee. He has an excellent track record for developing well-funded research programs sponsored by DOD (AFOSR, AFRL, AMRDEC, DTRA, MDA, NAVAIR, NAVSEA, NSWC, and ONR), DOE, DOT, EPA, FAA, NASA, and private companies. His research group specializes in “*Polymer Nanocomposites Technology Designed for Extreme Environments*” for four major research areas:

- Ablation Research
- Flame Retardant Polymers
- Additive Manufacturing Polymers
- Conductive Polymers and Composites

Dr. Koo’s publications include two books, *Polymer Nanocomposites: Processing, Characterization, and Applications*, McGraw-Hill, New York (2006), and *Fundamentals, Properties, and Applications of Polymer Nanocomposites*, Cambridge University Press, Cambridge, UK (2016), and over 550 papers/presentations in materials, thermal, and optical science disciplines. Two new books are forthcoming: *Ablation Science and Technology: Processing, Characterization, and Applications*, Cambridge University Press, Cambridge, UK (2019) and *Polymer Nanocomposites: Processing, Characterization and Applications*, 2<sup>nd</sup> Ed., McGraw-Hill, New York (2018).

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