

**PROFESSOR JOSEPH H. KOO***The University of Texas at Austin***ABSTRACT*****Ablation Science and Technology: Processing, Characterization, and Modeling***

The Koo Research Group (KRG) at UT Austin has been specializing in “Ablation research” for the past twelve years. Recently, the group has developed some very unique capabilities that could advance “Ablation research” using both experimental and numerical approach. The purpose of today’s seminar at RMIT University to introduce to our RMIT colleagues the methodology KRG has developed to solve this challenging problem. Past and current sponsors relating to our “Ablation research” include DoD (AFOSR, AFRL, AMDEC, DTRA, MDA, NAVAIR, NAVSEA, & ONR), DoE, NASA, and private companies. Today’s seminar includes the following topics:

- Nanostructured ablative material processing, characterization, and performance
- Oxy-acetylene test bed (OTB) and Inductively Coupled Plasma (ICP) with advanced diagnostics for ablative test & evaluation
- In situ ablation recession and thermal sensing technology
- Sensors to characterize nanostructured ablative char strength
- Thermophysical properties characterization of ablative
- Material response, heat transfer, and CFD modeling using industry-standard computer codes

**Date:** Friday August 10, 2018

**Time:** 12.30 - 1.30pm

**Location:** Building 251, Seminar Room | RMIT Bundoora East Campus



## ABOUT THE SPEAKER

Dr. Koo has 40 years of industrial and academic experience in program and engineering management. Currently, he is Senior Research Scientist/Research Professor, and Director of Polymer Nanocomposites Technology Lab in the Department of Mechanical Engineering at The University of Texas at Austin, Austin, TX. He is the founder of KAI and currently served 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 is the Editor-in-Chief, *Flame Retardancy and Thermal Stability of Materials* (<http://www.degruyter.com/view/j/flret>).

Dr. Koo specializes in polymer nanocomposites: processing, characterization, and applications, such as ablatives for thermal protection system and rocket propulsion system, flame retardant polymers for additive manufacturing, fire resistant nonwoven and woven fabrics, thermally conductive polymer matrix composites, sensors to measure in situ ablation recession and thermal properties, sensors to measure char strength, modeling of polymer degradation, material response ablation modeling, and hypersonic flowfield modeling. Dr. Koo's publications include two textbooks: *Polymer Nanocomposites: Processing, Characterization, and Applications*, McGraw-Hill, New York (2006), *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: *Polymer Nanocomposites: Processing, Characterization, and Applications*, 2<sup>nd</sup> ed., McGraw-Hill, New York (2018) and *Ablation Science and Technology: Processing, Characterization, and Modeling*, Cambridge University Press, Cambridge, UK (2019).

### **PROFESSOR JOSEPH H. KOO**

The University of Texas at Austin  
Dept. of Mechanical Engineering  
Texas Materials Institute, Austin, TX 78712-0292, USA  
[jkoo@mail.utexas.edu](mailto:jkoo@mail.utexas.edu) and [www.me.utexas.edu/~koo](http://www.me.utexas.edu/~koo)

