**Special Insights From the Development of Associating Fluid Models and the Limit of Infinite Dilution**

**Dr. Kenneth Cox**

**Chemical & Biomolecular Engineering Dept.**

**Rice University, Houston, TX**

**Abstract:** In spite of more than a century of evolution, we still find many limitations to available methods for modeling solution nonidealities. Even for systems involving relatively simple molecules, such as polar mixtures found in chemical processes, experimental data must often be used to determine a set of empirical parameters. A goal of our efforts is to leverage laboratory studies toward an understanding that leads to more fundamental models that minimize dependence on empirical parameters.

This presentation will demonstrate how an understanding of the limit of infinite dilution can lead to more predictive methods in hydrogen bonding systems. Similar methods can be applied to ionic systems where strong solvation effects dominate. It will also be shown that the same reasoning that leads to better prediction in hydrogen bonding systems can be applied directly to systems of mixed surfactants. The insights gained from these examples can be incorporated into molecular-based equation of state models that explicitly consider association effects.



**Biography:** **Kenneth R. Cox** currently serves as the Director of Undergraduate Studies and Professor in the Practice for Chemical and Biomolecular Engineering at Rice University in Houston, Texas.  He received his Ph.D. degree at the University of Illinois at Urbana Champaign in the field of molecular thermodynamics. Prior to joining the faculty at Rice University, Dr. Cox spent 4 years at The Ohio State University as an Associate Professor in Chemical Engineering and worked for 17 years in Corporate R&D Engineering with Shell Development Company in Houston. He is a registered Professional Engineer in the state of Texas and an AIChE Fellow.

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**Where: EP252**