The high temperature reactivity of metal/metal oxides are important in a wide variety of industrial applications including solar-thermal hydrogen generation, CO$_2$ sequestering, chemical-looping combustion, and energetic materials, among others. In this seminar I will discuss probing the reactivity of nanometals and metal oxides, towards developing a conceptual picture of rate limiting and phenomenological processes, in particular for application to energetic materials. This discussion will naturally lead to what makes nanoscale materials attractive for these applications, as well as some of their limitations.
Biography:
Michael Zachariah is Patrick and Marguerite Sung Distinguished Professor in Chemical Engineering and Chemistry. He has expertise in aerosol generated materials and has published extensively on the metrology of nanoparticles in both the liquid and gas phases. This includes the development of new mass-spectrometry and ion-mobility methods to characterize nanoparticles and their reactivity. He is a recipient of the University of Maryland Outstanding Researcher Award, and the Sinclair Award for Sustained Excellence in Aerosol Research awarded by the American Association for Aerosol Research.