The talk will focus on the use, both near-term and more futuristic, of nanomaterials for defense applications. Unlike commercial applications which seek to utilize nanotechnology to make products more marketable (longer hitting golf clubs/baseball bats, superior cosmetics, tougher automotive components, etc), the Department of Defense (DoD) is only concerned about providing the Warfighter with the most advanced technologies available. Therefore, DoD's impetus for exploring nanotechnology is primarily for enhanced lethality or increased survivability. Nanophase and nanostructured materials will be discussed, with an emphasis on the differences between the two. I will highlight some interesting work in areas such as pyrotechnics, energetics, and armor. Topics to be discussed range from semi-mature technologies which are on the verge of insertion into end items to futuristic (pie-in-the-sky) technologies for future forces.

ABOUT THE SPEAKER

Dr. Chris Haines is a Senior Materials Engineer at US Army Armament Research, Development and Engineering Center (ARDEC). He works in the Advanced Materials Branch, focusing on using nanotechnology to either improve legacy systems and/or enable future force technologies. His current research thrusts include evaluating nanomaterials for use in pyrotechnics, energetics, armor, and structural components.

During his career, Dr. Haines has worked in the areas of ceramics, fiber optics, rare-earth doped optical materials, nanopowder synthesis and processing, powder metallurgy, and failure analysis. Dr. Haines received his Ph.D. in Ceramic & Material Science Engineering from Rutgers University in 2003. He currently serves on the Industrial Advisory Board of the Mechanical & Aerospace Engineering department at Rutgers University and is President-elect of the Ceramic Association of New Jersey (CANJ) for 2013. Dr. Haines has also been named the Lead for the Ceramic Subgroup of a Lightweighting Study for the Defense Production Act Committee (DPAC).