ABSTRACT:

Multi scale modeling and AI guided development of multifunctional reduced dimensional materials for defense and space Technologies technology

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Major breakthroughs needed to meet 21st technical challenges in advancing defense and space technologies can be achieved through Nanotechnology with a convergent science based multidisciplinary approach for developing new generation atomically thin reduced dimensional materials designed for coordinated manipulation of electronic, photonic, magnetic, thermal and structural properties in nanostructure and nanocomposite formulations. This talk will introduce our program utilizing multiscale modeling and response theory coupled with Artificial Intelligence and materials informatics to develop multifunctional nanostructured core-shell zero dimensional materials , 2-D materials and their heterostructure and their application to defense and space technologies ,. Our materials development strategies include nontraditional chemistry and microbial synthesis approaches to make multicomponent nanomaterials .