

Fabric and Foam Materials Produced from Aligned Ultra High Aspect Ratio Carbon Nanotubes

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Carbon nanotubes (CNTs) are unique 1-dimensional structures that have an incredible set of properties along their length. This anisotropic behavior is often not completely transferred to the bulk material containing them when the CNTs are arranged in a completely random fiber architecture and contain significant bundling. It is often desirable to arrange the CNTs with a preferential orientation with significant individualization. The Bradford research group at NC State addresses this challenge by producing arrays of millimeter long aligned CNTs and using those as the base material for the production of CNT yarns, CNT fabrics and CNT foams. Bradford has applied these materials extensively in areas such as energy storage, fiber reinforced composites, filtration, thin film heaters, and sensing. This presentation will cover his latest work in these areas and outlook for these materials in the future.