Nanomechanics of graphene-polymer nanocomposites

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Graphene nanocomposites show hold great promise as materials for superior energy storage, e.g. batteries; for building strong and light-weight structures, e.g. wind turbine blades and for biomedical applications. However, their thermomechanical properties have not been understood well. In this project we will investigate these material properties through computational materials engineering methodology. Towards this end, large scale 3D molecular dynamics (MD) simulations will be conducted in order to investigate the fundamental failure mechanisms in these systems. Our particular attention will be the polymer/graphene interaface properties. The student should have background in solid mechanics; they will be trained in molecular dynamics simulations.