

## DEVELOPMENT OF NANOCOMPOSITE MATERIALS AND ESTABLISHMENT OF FACILITIES FOR NANO-MECHANICAL CHARACTERIZATION

It is now well established that materials behave differently at different length scales. For example a thick glass rod is much weaker than a micron size thick glass fiber. However, at present the interaction between these multiple length scales is not well understood. Also material properties can be profoundly affected by using different reinforcements or phases of different sizes. For example, the stiffness of a polymer plate can be increased significantly by adding a few percent by weight of submicron size particles, where as tens of percent of millimeter size particles, such as glass fibers, will be needed to achieve the same effect.

Hence efforts are being made to develop expertise and facilities for developing new nanocomposite materials and acquire instrumentation for mechanical and physical characterization of these materials on nanometer length scale.

### Objectives (Capabilities)

- Develop facilities for fabricating nanocomposite materials and acquire nanomechanical testing instrumentation.
- Expand the frontiers of knowledge in the area of multi-scale design of materials

### Application areas/Agencies

- Civil infrastructure
- Transport industry
- Develop new materials for critical applications

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