INTERAGENCY GRANTEES MEETING/WORKSHOP

Nanotechnology and the Environment: Applications and Implications

Interagency Panel Discussion – NSF Perspective

1. How does your agency view its research agenda as it relates to the environment?

The NSF investment in nanoscale environmental science and engineering derives from the recognition that many, perhaps most, Earth and planetary processes involve reactions at the surfaces of and interfaces between solids, liquids, and gases in the atmosphere, oceans, and solid earth. Detailed information about structures, compositions, and the properties of surfaces and interfaces is needed in order to understand the complex ecological systems found at and near the Earth's surface. NSF-funded research in the nano-environmental area over the past three years has focused on:

- nanoscale interactions at the interface between organic and inorganic solids, liquid and gases, and between living and non-living systems (e.g., studies of mineral-microbe interactions using force-sensitive microscopy)
- surface reactivity/activity of nanoparticles, nanopores, and nanocolloids in atmospheric and aquatic systems (e.g., C, Fe, Zn, U)
- development of nanoscale sensing devices for deployment in the environment

2. Can the research be applied to an environmental problem or possibly prevent an environmental problem?

Yes. A fundamental understanding of the properties of nanoparticles and nanopores (in particular, their reactivity/activity in the environment) may lead to better ways of contaminant remediation. An important example includes the use of metal nanoparticles in the reduction/destruction of chlorinated hydrocarbons and mobile heavy metals in groundwater systems.

3. Might the research cause an environmental problem?

The fate of nanoparticles in the environment is one area of study that is being addressed in several projects and will continue to be addressed in future research projects.