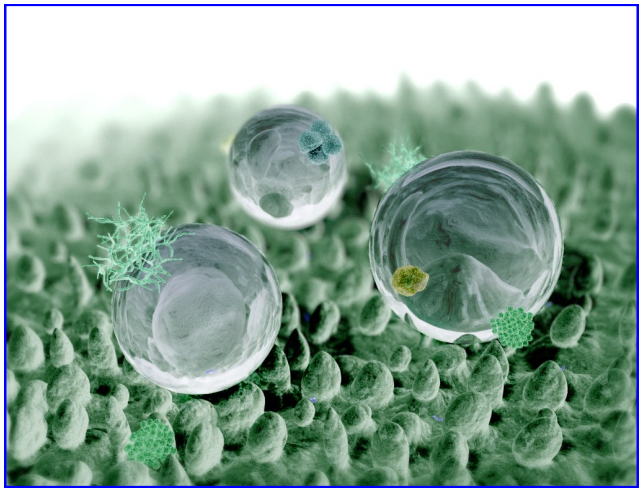
SENIC—Nanoscale Science and Engineering
Exploring Hydrophobic Materials

Explore!

1. Take a dropper bottle and place some water on the leaf. What happens?
2. Now place some water on the other objects.
3. Place a drop of water on the colored sand spoons and then on the regular sand spoon. What happens? Dip them in the cup of water.
4. Sprinkle some of the colored sand on top of the cup of water and then pour some of the colored sand into the cup. Use a regular spoon to scoop the sand out. What happens?



Images from: http://en.wikipedia.org/wiki/Lotus_effect

Hydrophobic Materials

Mother nature has been “doing” nanotechnology for a very long time. An example is the lotus leaf which beads up water because it has very fine surface structures that are also coated with hydrophobic wax crystals that are ~ 1nm in diameter. Dirt particles are picked up by the water drops because the nanostructures reduce adhesion.

Surfaces that are rough on the nanoscale tend to be more hydrophobic than smooth surfaces because of the reduced contact area between the water and solid. In a lotus plant, the actual contact area is only 2-3% of the droplet covered surface.

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Hydrophobic properties in nature can be found in a desert beetle and on the feathers of many birds

Nambib Desert Beetle

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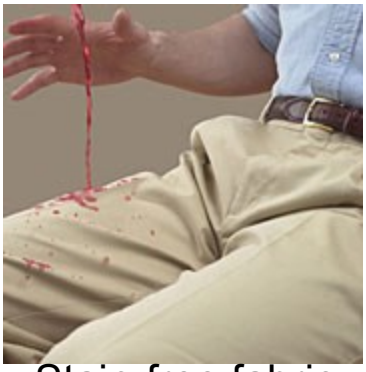
Copying nature

Magic Sand—designed to clean up oil spills



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