11.2.3 Nano in Nature

Nanoscale structures existed in nature long before scientists began studying them in laboratories.

A few examples

Nano in Nature

Object

A single strand of DNA, the building block of all living things, is about three nanometers wide.

Mimic in laboratories

Manipulation of colours by adjusting the size of nano particles with which the materials are made.

Nano in Nature

Object

The scales on the wings of a morpho butterfly contain nanostructures that change the way light waves interact with each other, giving the wings brilliant metallic blue and green hues.

Object

Peacock feathers get their iridescent coloration from light interacting with 2 dimensional photonic crystal structures just tens of nanometers thick.

Nano in Nature

Mimic in laboratories

Similar nano structures are made in lab to glow in different colors.

Parrot fish crunches up coral all day. The source of the parrotfish's powerful bite is the interwoven fibre nanostructure. Crystals of a mineral called fluorapatite are woven together in a chain mail-like arrangement. This structure gives parrotfish teeth incredible durability.

Mimic in laboratories

Water repellant Nano paints are made. Coating with such nano paints give durability, protection against stains and dirt also enhances fuel efficiency when coated on ships.

Nano in Nature

Object

Lotus leaf surface Scanning electron micrograph (SEM) showing the nano structures on the surface of a leaf from a lotus plant. This is the reason for self cleaning process in lotus leaf.

Nano in Nature

Mimic in laboratories

The natural structure provides a blueprint for creating ultra-durable synthetic materials that could be useful for mechanical components in electronics, and in other devices that undergo repetitive movement, abrasion, and contact stress.