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- News Bulletin
- Student's Question of the Day
- Not wonder, this is Physics
- New Research

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News Bulletin

1. Dr. Ashfaq Ahmad joined as head, department of Physics, CIIT, Lahore.
2. Dr. Shaoib Munir, assistant professor of Physics, left for Post Doc. Research in Mexico. A farewell dinner was arranged by the department for him on July 23, 2008. Director CIIT Lahore, Dr. Shaukat Ali Hayat, also honored the occasion by his presence.
3. A research paper written by Dr. Afaq Ahmad, assistant professor, titled "Photo Detachment of H-ions near a partially reflecting surface-I" was published in Chinese Physics Letters, Vol. 25, No. 2 (2008) 475-478.
4. Dr. Muhammad Asif, assistant professor, attended ICTP International conference 2008, in Italy and Second ITER Summer College 2008 in Japan, this month.
5. Dr. Arshad Saleem Bhatti, Chairman Physics department CIIT, visited Lahore Campus on July 18, 2008.

Student's Question of the Day**What are nanomaterials?**

In physics, the prefix nano (symbol n) is used to show very small quantities or dimensions such as diameter of an atom, thickness of thin film, wavelength of light etc. For example, one nanometer (symbol nm) length is equal to one billionth of a meter or 10^{-9}m and is approximately equivalent to the length of ten Hydrogen or five Silicon atoms when placed in a line. Another prefix most commonly used in Physics is micro (symbol μ) whose value is 10^{-6} . One micro is one thousand times bigger than one nano i.e. $1\mu\text{m} = 1000\text{ nm}$.

In our daily life most of the materials become solid at room temperature after melting when cool down. If we look inside these solids under high resolving power microscopes such as Scanning Electron Microscope (SEM) or Transmission Electron Microscope (TEM), we observe that atoms of the materials periodically

arranged themselves in small crystals which are randomly oriented throughout the materials via different bonds. These small crystals are called crystallite(s) and most of physical properties of the materials depend on nature and size of the crystallites. Under normal preparation conditions, materials having crystallites in micrometer range, exhibit physical properties similar to that of their bulk form. However, the materials having crystallites in the nano range (1nm-100 nm) exhibit physical properties different from that of their bulk or micro crystallites. For example, materials with crystallite in the nanometer scale have low melting point and reduced lattice constant (distance between neighboring atoms in a unit cell). One of the reasons for superior properties of nano materials is that the number of surface atoms or ions becomes a significant fraction of the total number of atoms or ions and their surface energy plays a significant role in the thermal stability. The technology based on nanomaterials is usually known as nanotechnology and is the focus of current research of physics community. Some of our faculty members including me are involved in the same area of research.

Dr. A. Ashfaq
(Head, Physics, CIIT Lahore)

Not wonder, this is Physics

The sky is blue because of Rayleigh scattering. The sun light is composed of all colors of the rainbow, mixed together to make white light. The red and yellow lights pass through air easily, but some of the blue portion of sunlight is scattered in every direction by air molecules. This scattering causes the sky to be blue.

New Research

Graphene quantum dots as single electron transistor:

A group of Physicists at the University of Manchester have created single-electron transistors as small as 30-nm in size on two-dimensional Carbon.

(Ponomarenko et al., Science, 18 April 2008
Vol. 320 pages: 356-358.)