

CARBON NANOMATERIALS

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The course will give an introduction into the physics and materials science of carbon. The basic modifications of carbon - graphite and diamond - are known since ages, but new and highly interesting structures have been discovered, synthesized, and characterized in the past years. Among these are the fullerenes, carbon nanotubes, and graphene. These nanomaterials have unusual and extreme electrical, thermal, and mechanical properties, making them ideal components for many applications in future devices. Examples are the ballistic electron conductivity in graphene and nanotubes or their extreme tensile strength. Emphasis will be put on graphene as a real two-dimensional material with monoatomic thickness and carbon nanotubes as one of the most promising materials with almost one-dimensional character. Graphene, carbon nanotubes, or nanodiamonds are of considerable current interest in several research projects at the Ecole Doctorale.

Main topics:

1. The carbon atom
2. The bulk phases: graphite and diamond
3. Graphene and graphite
4. Carbon nanotubes
5. Fullerenes
6. Diamond
7. Carbon nanocomposites
8. Other modifications of carbon
9. New technologies on the basis of carbon

Time: Les cours auront lieu les jeudis 13, 20 et 27 janvier et les 3, 10 et 17 février 2011 de 16:00 à 18:00 h.

Place: Auditorium, Institut de Physique et Chimie des Matériaux de Strasbourg, 23 rue du Loess, 67034 Strasbourg.

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