



## **Prof. Michael Giersig- work plan as Visiting Professor at the Center for Advanced Studies, Warsaw University of Technology**

### General overview

The content of my lectures entitled “Nanoparticle based Nanotechnology” is a result of my recent research and educational activities concerning the molecular behavior of condensed matter in small systems. It contains a special point of view on nanosystems based on my prior experiences dealing with the study of matter, especially the magnetic, optic and electronic properties of these nanomaterials. Nanomaterials are a field that takes a material-science based approach to nanotechnology. We will start with an overview of their treatment in nanotechnology with special emphasis on the history and early milestones. The fundamentals of nanotechnology will then be explained, for the freshmen or the general public course, including the scaling laws which give insight on the physical ramifications of miniaturization.

In this course we will provide the specific fundamental differences between macro scale and nanoscale phenomena. The specific materialistic properties of nanoobjects, such as metals, semiconductors, magnetic and carbon based materials, will be delivered in other series of lectures for master and PhD students.

### **Metallic nanoparticles: synthesis characterization and application**

#### Abstract

The advancement of the understanding of small-particles sciences and the potential for new materials science based on the chemistry and physics of nanoscale metal clusters rests on the measurement and application of useful size- dependent properties of small metal nanoparticles. With this consideration in mind we will discuss the synthesis and production of noble metal particles and described the optical, structural and electronic characterization method as well as their potential application in electronic and biomedicine.