

Speaker: Giovanni Dietler, EPFL, Lausanne, Switzerland.

Titel : "DNA from the Polymer Physics Point of View: Topology and Dimensionality Effects"

Abstract: Single and double-stranded DNA molecules of different topologies (linear, circular and knotted) in 2 D and 3 D conformation were imaged using Atomic Force Microscopy (AFM). After tracing the trajectory of the molecules, it was possible to calculate different scale dependent statistical quantities like the radius of gyration, the end-to-end distance, the distribution of the end-to-end distance and the shape (asphericity). These quantities in turn permit to determine the critical exponents describing the divergence of the radius of gyration with the length of the DNA molecule and the distributions. It was possible to compare the experimental distributions for the above-mentioned quantities with the theoretical one. Additionally, because of the fact that DNA has a rather large persistence length (50 nm), theories for semi-flexible polymers could be tested. The above experiments were carried out with topologically constrained DNA molecules: namely linear, circular, and knotted DNA.