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BOOK OF ABSTRACT

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#P046 - Proteins in saccharides matrices: biochemical and biophysical aspects

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Embedding biomolecules in saccharide matrices leads to a series of peculiar properties that are relevant from the point of view of both biochemistry and biophysics, and have important implications on related fields such as food industry, pharmaceutics, and medicine. In this poster we present results from a combination of experimental (FTIR, SAXS, DSC, Light Scattering) and simulative (MD) techniques on solutions or glassy matrices of oligo- and disaccharides at different water content, rigidity and temperatures, both in the presence and in the absence of proteins. The perspective is to set up a connection between the biophysical approach, which is generally "***protein-centric***", and the pharmaceutical/applicative approach, which is traditionally "***stabilization-procedure centric***". The attention is addressed in particular to the modulation of systems dynamics, to its hydration, temperature, and composition dependence, and to the molecular origin of the trehalose peculiarity.

#P047 - Nanoring as logic gate and memory mass device

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We study the application of one nanoring driven by a laser field in different states of polarization in logic circuits. In particular we show that assigning boolean values to different state of the incident

laser field and to the emitted signals, we can create logic gates such as OR, XOR and AND. We also show the possibility to make logic circuits such as half-adder and full-adder using one and two nanoring respectively. Using two nanorings we made the Toffoli gate. Finally we use the final angular momentum acquired by the electron to store information and hence show the possibility to use an array of nanorings as a mass memory device.

#P048 - Influence of the nanometer scale ring structure on the vibrational and relaxational dynamics of glasses

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Although glasses have been largely used for a wide variety of technological applications, much of their underlying structure and dynamical properties remain puzzling. We present a detailed investigation of the intermediate range structure of a series of alkaline borate glasses carried out by performing neutron diffraction measurements. We propose that the First Sharp Diffraction Peak of glasses arises from the periodicity of the boundaries of voids in a random network and put forward a model which explains its compositional and pressure dependence. In this model the planar section of a void is a n-membered ring of all-side vertex sharing basic structural units. Furthermore, we establish a correlation between the low frequency vibrational dynamics, the structural relaxation processes and the presence of voids on the nanometer length scale in several ring structured systems.

#P049 - Highly flexible, conductive and transparent ZnO:Al/Ag/ZnO:Al multilayer electrode

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