CICLO DE SEMINARIOS 2010

SMAT-C Soft Matter Research and Technology Center

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"The Glass Transition: Simple Theory for a Complex Problem"

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When a liquid is quenched below its glass transition temperature, it goes into a metastable state which is neither crystalline solid (no long range order) nor liquid (it resists shear forces): It becomes a glass. The mystifying origin of the colossal slowing down (~10 orders of magnitude) of the dynamics close to the liquid-glass transition continues to ignite scorching debates nowadays. I will show how a simple change of variables allows one to establish a discrete statistical mechanics theory based on well defined energies and degeneracies of the new degrees of freedom. In addition to explaining the spectacular super-Arrhenius increase of relaxation times, this theory quantitatively predicts the thermodynamic properties (energy, entropy) of several model glass formers. Finally I will show that the same formalism carries over to the study of the elastoplasticity of amorphous solids. Recent results concerning the statistical physics of these out of equilibrium materials will be presented during the talk.

M a r t e s 13 a b r i l , 14:00 h o r a s

Sala Conferencias, Tercer Piso - Departamento de Física
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