**Department of Chemical Engineering Seminar Series**

**Towards a Fundamental Statistical Theory of Non-equilibrium and Arrested Systems**

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**Abstract**

A non-equilibrium extension of Onsager’s canonical theory of thermal fluctuations is employed to derive a self-consistent theory for the description of the statistical properties of the instantaneous local concentration profile of a colloidal liquid in terms of the coupled time evolution equations of its mean value and of the covariance of its fluctuations. These two coarse grained equations involve a local mobility function which, in its turn, is written in terms of the memory function of the two-time correlation function. This theory, known as the Non-Equilibrium Self-Consistent Generalized Langevin Equation (NE-SCGLE) theory, also provides a general  theoretical framework to describe irreversible processes associated with dynamic arrest transitions, such as aging, and the kinetics of glass and gel formation. In addition, selected applications are introduced in order to illustrate the predictive power of the theoretical framework.

**Bio**

Professor Pedro E. Ramírez-Gonzalez was born in San Luis Potosí, México on July 20th of 1982. He completed his doctoral studies at the Institute of Physics, Autonomous University of San Luis Potosí. After a short period of working in the plastics industry, he spent two years at the Institute of Theoretical Physics Chinese Academy of Sciences occupiyng a posdoctoral position. As of 2014, he works as an associated professor at the Autonomous University of San Luis Potosí. The research interests of Professor Ramírez-Gonzalez focus in glass transition, physical aging and non-equilibrium thermodynamics.

**Seminar**

**Friday, September 8, 2017**

**3:00 pm**

**Livermore 101**