

# Sommerfeld Theory Colloquium

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## **Glassy Relaxation: a Paradigm for Condensed Matter Dynamics**

Complex features of the correlation functions and spectra of a glass-forming liquids have been identified during the past two decades by experimental and molecular-dynamics-simulation studies. In order to explain these findings, closed non-linear equations of motion have been motivated for a statistical description of the dynamics of strongly-interacting homogeneous matter, which treat density fluctuations and force fluctuation simultaneously. These equations exhibit bifurcations, which all belong to the class of cuspid singularities. the basic fold bifurcation describes a transition from the dynamics of a liquid to one of an amorphous solid; it deals with an idealized glass-transition. The interplay of non-linearities and diverging retardation effects leads to a scenario for a bifurcation dynamics, which has no analogy to the ones studied in other theories of non-linear motion. The basic features of the scenario will be described. Some examples will be shown, which demonstrate the relation between theory and observations made for cooled liquids, concentrated colloids, and dense polymer melts.

**Wednesday, 28<sup>th</sup> June 06, 11.15 h , Room 348 / 349, Theresienstr. 37 / III**