Quasi-stationary states in long-range interacting systems

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Systems with long-range interactions, like gravitational systems, unscreened charged systems and dipolar systems, can be made extensive, but are intrinsically non additive. The violation of this basic property of thermodynamics is at the origin of many intriguing phenomena at statistical equilibrium. Even more interesting is the process of relaxation to equilibrium: it has been shown for some specific models that systems with long-range interactions remain trapped in quasi-stationary states, whose lifetime diverges with system size. Different theoretical approaches have been developed to justify the presence of these states. Some of them are based on kinetic equations where mean-field effects play a relevant role. In my talk I will give an account of the main progresses in this broad field of research, focusing on some recent results concerning linear response theory.

References:

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