Nonlinear fluctuations of particle systems

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Abstract:
We consider one-dimensional conservative interacting particle systems and we analyze the equilibrium fluctuations of the conserved quantities of the system. For that purpose, we derive a second-order Boltzmann-Gibbs principle, which allows to replace local functionals of the system by a function of the conserved quantity. As a consequence of this Principle, we prove, under quite general conditions, that the density fluctuation field associated to these models is sequentially compact and any limit point is a solution of the stochastic Burgers equation. Our method applies to, for example, exclusion processes, zero-range processes and kinetically constrained exclusion processes among others.
This is a joint work with Milton Jara (IMPA) and Sunder Sethuraman (Arizona University).