[Talk 4] Dynamical symmetry breaking in boundary-driven diffusive systems carrying atypical currents

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The probability of observing a sustained atypical current J is encoded in its large deviation function (LDF). For a given value of J, there often exists a corresponding optimal density profile. Here we show that for a large class of boundary-driven diffusive systems the current LDF exhibits a singularity at a certain threshold $J = J_c$. Depending on the model, the singularity is associated either with a symmetry breaking in the optimal profile or a first-order jump from one profile to another, both of which are shown to be described by a Landau theory. Specific microscopic models exhibiting such singularities will be discussed.