In this talk, we will study the mean field limit of weakly interacting diffusions for confining and interaction potentials that are not necessarily convex. We explore the relationship between the large N limit of the constant in the logarithmic Sobolev inequality (LSI) for the N-particle system and the presence or absence of phase transitions for the mean field limit. The non-degeneracy of the LSI constant will be shown to have far reaching consequences, especially in the context of uniform-in-time propagation of chaos and the behaviour of equilibrium fluctuations. This will be done by employing techniques from the theory of gradient flows in the 2-Wasserstein distance, specifically the Riemannian calculus on the space of probability measures.