Curvature bound of the Dyson Brownian motion

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The Dyson Brownian motion (DBM) is an eigenvalue process of a certain Hermitian matrix valued Brownian motion introduced by Freeman Dyson in 1962, which has been one of the central subjects of random matrix theory. In this talk, we study the DBM from a geometric perspective. We show that the infinite particle Dyson Brownian motion possesses a non-negative Ricci curvature lower bound à la Bakry-Émery. As a consequence, we obtain various quantitative estimates of the transition probability of the DBM as well as the characterisation of the DBM as the gradient flow of the relative entropy in a certain Wasserstein-type space.