

In this talk I will describe how the formal Riemannian structure of Felix Otto on the space of probability measures can be used to study the homogeneous Stochastic Vicsek model for self propelled particles. Cedric Villani and Otto described the relationship between the logarithmic Sobolev inequality and the Fokker-Planck equation exploiting its variational formulation as the Wasserstein gradient flow of the relative entropy. I will describe the variational formulation of the model in the space of probability measures using a non displacement convex functional. Then I will outline proofs of existence, uniqueness, stability, convergence to a finite dimensional submanifold of equilibrium states and long term convergence to a steady state. This is a joint work with Alessio Figalli and Moon-Jin Kang.