Schrödinger problems with interacting particles: propagation of chaos

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The mean field Schrödinger problem (MFSP) is the problem of finding the most likely path of a McKean-Vlasov type particle with constrained initial and final configurations. It was first introduced by Backhoff et al. (2020), who studied its existence and long-time behavior. This talk aims to show how ideas from propagation of chaos for backward particle systems allow us to derive the MFSP as the (large population) limit of a sequence of classical Schrödinger problems among finite (but interacting) particles. The method rests upon the study of suitably penalized problems using stochastic control techniques, and it further allows us to derive other interesting results on the MFSP.