One dimensional multi-agent optimal control and Mean Field limits with density constraints

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In this talk I will consider a deterministic system (in one dimension) of many evolving interacting agents with constraints on the reciprocal distance between agents, in which each agent chooses its speed in order to minimize an energy depending on the position of the other agents through an aggregative potential (given in term of an interaction kernel and a coercive function). I will focus on periodic (in time) patterns of this model, discussing their qualitative properties, and its macroscopic mean-field limit as the number of agents tends to infinity. The talk is based on joint works with Marco Cirant (Padova).