

Abstract: Emergence is a phenomenon of formation of collective outcomes in systems where communications between agents has local range. For a wide range of applications, such as swarming behavior of animals or exchange of opinions between individuals, such outcomes result in a globally aligned state or congregation of aligned clusters. The classical result of Cucker and Smale states that alignment is unconditional in groups that facilitate global interactions with non-integrable radial tails. Proving a similar statement for purely local interactions is a challenging mathematical problem. There have been several programs of research directed towards understanding the emergent phenomena on micro, kinetic, and macro levels of description. In this talk we will mostly focus on the kinetic approach and demonstrate its connection with the classical problem of relaxation for non-perturbative data.