

A panoramic view of the collective dynamics

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ABSTRACT

Collective behaviors of oscillatory complex systems are ubiquitous in our nature, e.g. flashing of fireflies, chorusing of crickets, synchronous ring of cardiac pacemaker and metabolic synchrony in yeast cell suspension, etc. In this talk, I will present a short summary of recent progress on the mathematical studies for the collective dynamics of classical and quantum many-body systems and discuss some challenging mathematical and engineering problems arising from the collective dynamics.