
Applied Mathematics Seminar



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SQUID metamaterials: A testbed for nonlinear dynamics

The interplay between nonlinearity and structure is at the center of research on complex systems. In ensembles of coupled oscillators, the synergy between topological features and the underlying dynamics may lead to interesting self-organized phenomena. I will present a system that is capable of exhibiting such complex dynamics: a SQUID (superconducting quantum-interference device) metamaterial, i. e. an artificially structured medium of periodically arranged, weakly coupled SQUIDs, which shows extraordinary electromagnetic properties and tunability. From a dynamics point of view, the single SQUID is a highly nonlinear system exhibiting extreme multistability and chaos. I will talk about the emergent collective behavior in one-dimensional and two-dimensional SQUID arrays. The focus will be on spatiotemporal pattern formation and chimera states, a counter-intuitive symmetry breaking phenomenon of partial synchronization.

Thursday, 22.04.2021 · 12pm online (via MS Teams)

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