

PHYSICAL MATHEMATICS SEMINAR

Universal dynamics in damped-driven systems

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ABSTRACT:

Damped-driven systems are universal, with the energy balance in such systems producing canonical behaviors that are prevalent in a broad range of physical systems that are spatio-temporal in nature, including for example, mode-locked lasers, rotating detonation engines (RDEs), optical communications systems, and the quantum hydrodynamic analog system. In each of these systems, the gain-loss dynamics produces a universal, underlying bifurcation structure. Specifically, there is an observed period doubling route to chaos as the driving is increased. This instability cascade has been characterized experimentally in a number of systems with significantly different underlying physics. Thus the same underlying bifurcating cascade, which is exemplified by the logistic map, is a manifestation of canonical damped-driven dynamics in spatially extended systems.

TUESDAY, MARCH 29, 2022

2:30 PM – 3:30 PM

<https://math.mit.edu/sites/pms/>

Zoom Link...

<https://mit.zoom.us/j/95597721876>