PHYSICAL MATHEMATICS SEMINAR

Snaking in the Swift-Hohenberg Equation in Dimension 1+Epsilon

JASON BRAMBURGER

Brown University

ABSTRACT:

The Swift-Hohenberg equation is a widely studied partial differential equation, which is known to support a variety of spatially localized structures. The one-dimensional equation exhibits spatially localized steady-state solutions, which give way to a bifurcation structure known as snaking. That is, these solutions bounce between two different values of the bifurcation parameter while ascending in norm. The mechanism that drives snaking in one spatial dimension is now well-understood, but recent numerical investigations indicate that upon moving to two spatial dimensions, the related radially-symmetric spatially-localized solutions take on a significantly different snaking structure which consists of three major components. To understand this transition we apply a dimensional perturbation in an effort to use well-developed methods of perturbation theory and dynamical systems. In particular, we are able to identify key characteristics that lead to the segmentation of the snaking branch and therefore provide insight into how the bifurcation structure changes with the spatial dimension.

TUESDAY, DECEMBER 11, 2018
2:30 pm
Building 2, Room 136

Reception following in Building 2, Room 290
(Math Dept. Common Room)

http://math.mit.edu/seminars/pms/

Massachusetts Institute of Technology