PHYSICAL MATH SEMINAR

Growing Patterns

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ABSTRACT:

Pattern forming systems typically allow for a broad array of coherent states, with varying wavelength and orientation. In the standard situation of formation via small random fluctuations of an unstable homogeneous state, defects disrupt and bound patches of coherent patterns. Growth and heterogeneity is a powerful way to select and control the type of pattern formed in a system. Examples include moving masks in light-sensitive chemical reactions, directional solidification in crystals, and varying domain shape in fluid convection. We present recent results on selection when the patterned region expands in time. We use prototypical directional quenching mechanisms to study this situation in a theoretically accessible but application-relevant setting. We find a wealth of wavenumber selection phenomena which can be organized using bifurcation diagrams which depict the wavenumber of a striped state as a function growth rate.

TUESDAY, OCTOBER 1, 2024
2:30 PM – 3:30 PM
Building 2, Room 449