Pattern formation

\[ \frac{\partial n}{\partial t} = -D \nabla (-D \nabla n + kn^4) \]

\[ \text{ (+ reflecting buds)} \]

Threshold phenomenon:

* **Low average pop. dens.**
  Diffusion dominates and the spatially homogeneous equil. is stable.

* **High average pop. dens.**
  Auto-taxis dominates and the pop. collapses into a collection of dorso-ventral peaks.

The pop. auto-taxis may be direct (as in the example above) or indirect (as in the Dictyostelium example of the previous lecture).