Synchronization

Fireflies

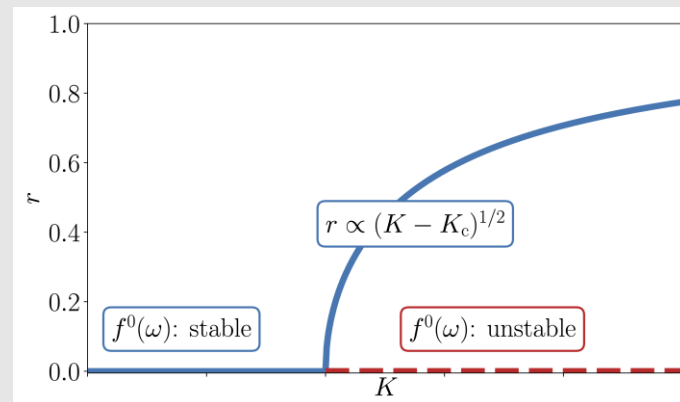Metronomes
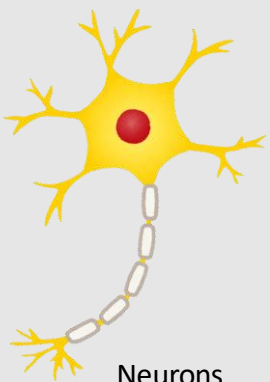
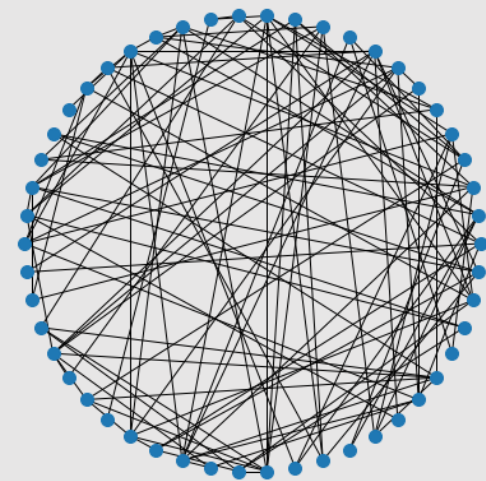Neurons

Coupled phase-oscillator model

$$\frac{\mathrm{d}\theta_i}{\mathrm{d}t} = \omega_i + \sum_{j=1}^{N} \Gamma_{ij}(\theta_j - \theta_i)$$

Theory

$r \propto (K - K_{\mathrm{c}})^{1/2}$

$f^0(\omega)$: stable

$f^0(\omega)$: unstable

Bifurcation theory
Phase transition

Network structure